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AND AMERICAN GARDENER'S MAGAZINE.

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D. K. MINOR, Proprietor.] FOR MAY, 1833. [SAMUEL FLEET, Editor.

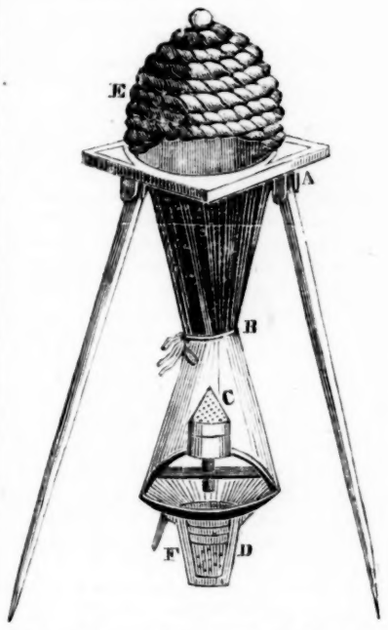
ORIGINAL COMMUNICATIONS.

NUTT'S FUMIGATOR FOR BEES.—When it is remembered that the quantity of domestic Honey consumed is very great, that it is an article of considerable importation from the Havana, and that bees with proper management can be very rapidly increased, the subject becomes of importance—a source of profit, pleasure and luxury, to no small portion of our population. In addition to the information given on the first page of our last number, we subjoin the following, from Nutt's "Humanity to Bees." Although the article has more particular reference to hives of straw, yet we suppose those who rear bees in other hives will be enabled to render the information serviceable.

Fumigation is rather a portentous word; but, as soon as I shall have explained for what purposes, and in what manner, I occasionally make use of it, it will be totally divested of all *deadly* signification. In my practice it is not a bee-destroyer, but a bee-preserver; when resorted to in my practice it is never carried, nor intended to be carried, to suffocation: but, in the operation of uniting weak swarms or poor stocks with more wealthy and prosperous ones, which I consider to be a meritorious and most humane practice—when it is necessary to examine the state and condition of even a populous colony, should unfavorable symptoms as to its healthiness or its prosperity manifest themselves,—when it is known, or but suspected, that there are wax-moths, mice, spiders, or other bee enemies, lodged in a hive, which the bees of themselves cannot dislodge nor get rid of, and which, if not got rid of by man's assistance, would soon destroy almost any colony,—when bees and their works (for I never transfer the former without transferring an ample sufficiency of the latter at the same time) are to be taken out of a decayed straw hive, and to be put into a more substantial one, or into collateral boxes, which I hold to be the best of all hives,—and on innumerable other occasions,—it is absolutely necessary *to subdue bees* so far as to render them incapable of using that formidable venomous little weapon with which Providence has armed them, and which generally dreaded little weapon they can use so dexterously before we can operate upon them for their own good. By means of a very simple apparatus, which may be called *a fumigator*, and which is a contrivance as novel and as useful in the management of bees as any of my hives or other inventions, *bees may be totally subdued without being injured in the slightest degree, and dealt with as if they had neither stings nor wings.*

I beg leave to re-state distinctly—that, in taking off a box or a glass of honey, *no fumigation whatever is necessary*, or ever practised by me. It is only in cases such as those just enumerated that I have recourse to it; but in no case for the destruction of bees. Fumigation, therefore, in my practice is not suffocation.

The following figure is a representation of a fumigator, which a brief explanation will render intelligible:



This useful article consists of a square top-board, upon which is placed a straw hive (E), so as to show an open circular space under the hive and through the square board into the bag below. I need hardly observe that the straw hive is no part of the fumigator, but is here represented as standing upon it in order to exemplify its use. The top-board is of inch deal, and is nineteen or twenty inches square. A round piece is cut out of its centre of not more than thirteen inches in diameter—that being something near to, or perhaps rather more than, the inside diameter of a common hive—so that a hive will stand upon the wooden circumference of the part left, without there being any ledge inside, that is, any part so inclosed by the hive as to catch and detain the falling bees. From the upper edge of this circle is suspended a bag, a yard in length, made of glazed calico, the bottom part of which draws round the rim of a shallow, funnel-shaped, tin bee-receiver, which bee-receiver is about ten inches across at the top, and its lower part, or neck (D or F), is three inches and a half in length, and its throat (if I may so term it) is nearly three inches in width. To fit this neck, which is thickly perforated for the purpose of admitting fresh air when fresh air may be required, is a close lid, just like that of a common tin canister, to hold up the fumigated bees, and also to stop the ventilation when not wanted. C is the fumigating lamp, with a perforated top, through which the fume ascends, and is made conical, that so a fumigated bee in its fall cannot rest upon it, and be thereby scorched or injured, as would inevitably be the case were this top flat. The tie (B) closes the bag and keeps every bee above until the lamp and every thing below be adjusted, and it is *then* to be untied. The fumigator is here represented as standing upon three legs, made fast to the top-board by small bolts, as at A; but it is quite as convenient in practice, and more portable, if, instead of these legs, it be made like a common scale, with a cord from each corner, which may be gathered into a small iron hook, and thereby suspended from the branch of a tree, or from any other convenient place, when used; the lower part of the bag is represented as being transparent, but that is done purposely to show how the lamp is placed inside when prepared for operation.

By persons inexperienced in such matters, it may be thought to be an extraordinary feat to unite the bees of one hive with those of another—to bind, as it were, the legs and wings, and *pro tempore* to render useless the sting of every individual bee, until such union be effected. Nothing, however, is more easy, nor is any part of apiarian practice attended with more pleasing consequences to the operator, or with more important and beneficial results to the bees themselves. When in a state of temporary intoxication from the fume made to ascend through the perforated tin (C) into their hive, these beautiful insects are perfectly manageable,—perfectly harmless.

This intoxicating fume is caused by introducing into the fumigating lamp a piece of ignited vegetable substance, called puck, puck-ball, or frog-cheese, or, most commonly, *fuzzball*. It is a species of fungus, or mushroom, and is plentiful enough in the autumn in rank pastures, and in rich eddishes. Shepherds, milk-maids, or country schoolboys, are well acquainted with them,—know very well where to find them,—and for a mere trifle will easily pick up as many of them as will supply the demands of twenty apiarians. They are frequently as large as a man's head, or larger. In 1826, I had an unripe white puck-ball, which weighed ten pounds. When ripe they are internally of a brown color, and, turning to powder, become exceedingly light, and are then properly *fuzzballs*. When you have procured one of these pucks, put it into a large piece of stout paper,—press it down therein to two-thirds, or, if you can, to one-half, of its original size, and tie it up very closely,—and lastly, put it into an oven some time after the household bread is drawn, that is, when the oven is nearly cool, and let it remain

there all night, or until it will hold fire, and smother away like touch-wood, that is, burn without kindling into flame. In this state it is fit for the lamp, and may be used in the manner following:

Take a piece of this prepared fungus, as large as a hen's egg (it is better to have too much of it than too little to begin with); ignite one end of it with a candle, and then put it into the fumigating lamp; next fix the lamp in its socket over the bee-receiver, and place the whole inside the bag, as shown in the plate, and untie the fastening (B) round the middle. In a very short space of time the bees in the hive placed upon the top-board (which is necessarily the first thing to be attended to in every operation of this kind) will be totally under your control. The operator should be particularly careful to close every vacancy, however small, that there may happen to be between the top-board and the edge of the hive, by tying a cloth round it—the hive—as soon as ever it is placed upon the board. This precaution will prevent the escape of any of the fume, and will also prevent the bees from annoying the operator during the fumigating process.

In the course of a minute, or very little more, you will with delight hear the bees dropping like hail into their receiver, at the bottom of the fumigating apparatus.

When the major part of them are down, and you hear but few fall, you may beat the top of the hive gently with your hands, in order to get as many down as you can. Then loosening the cloth, lift the hive off and set it upon a table, or upon a broad board, prepared for the purpose, and knocking the hive against it several times, many more bees will fall down, and perhaps the queen among the rest; for as she is generally found to lodge near the crown of the hive, she often falls one of the last. If the queen is not among the bees on the table, then search for her among the main body in the bee-receiver; first, however, putting them upon the table, if you discover her not before lying among the uppermost bees therein.

During this search for the queen you must be proceeding in a similar manner with the bees in the other hive, with which those already fumigated are to be united. As soon as the bees of the hive last fumigated are all composed and quiet, and you have found and secured one of the queens, you may put the bees of both hives together into one, mingling them thoroughly together, and sprinkling them at the same time with a little ale and sugar; then put them and *one only* of the two queens among the combs of the hive you intend them to inhabit, and gently shake them down into it. When you have thus got all the bees of your two hives into one, cover it with a cloth, and bind the corners of that cloth close about it, and let them stand during that night and the next day, shut or closed up in this manner, so that a bee may not get out.

In the evening of the following day, at the dusk hour, loose the corners of the cloth and remove it from the mouth of the hive (taking care of yourself), and the bees will with a great noise immediately sally forth; but being too late to take wing, they will presently go in again, and ever after remain satisfied in and with their new abode—new, at least, to one half of them, and new to the other half also when transferred into a fresh hive, or into boxes.

Deficiency of Taste for Gardening in the People of the United States. By N. N. To the Editor of the New-York Farmer and American Gardener's Magazine.

MR. EDITOR,—The people of these United States stand reproved by the united voice of strangers from Europe, for their deficiency in a refined taste. And, by this, I do not understand them to say that we are deficient in our taste for poetry, painting, and sculpture, merely, but that we do not duly appreciate the beauty, order, proportion, and excellence, which *art* can impart to almost any object or subject. And although we have been exhibited in caricature, and cruelly defamed by a number of those sinister vagrants, yet as it respects our passion for the art of *Gardening*, I confess we stand justly reproved. Many are disposed to find our excuse, for our deficiency in this respect, in our extreme youth as a nation, and in our want of means and opportunities to devote to this object. But what are the means and opportunities of our farmers and mechanics, compared with those of the same calling in England? There is a palpable excess in favor of the American farmer and mechanic; and yet we are told by our countrymen, who have visited Europe, that, in England especially, the humblest cottage has a small plat of ground appended to it, which is devoted to horticultural productions, and on which are exhibited diligence and taste. The cottage itself is hung around with wild or cultivated vines, whose blossoms make their daily tribute of grateful fragrance to the occupants of the humble dwelling. This is wise. Man lives to enjoy the bounteous goodness of his Creator; and if by a salutary care and diligence he can strew around him the *agreeables* in nature in greater profusion than a wise Providence has seen fit to bestow, without this agency of his creature, he has a right to do so, and those things will come to his aid in sustaining the ills which are incident to this state of being; and that is certainly worthy of the attention of every man which will lighten the burdens of life, and render *home* a delight, although it should be one of poverty. But it is painful to reflect how little these things seem to be understood in this country: with the exception of some gardens in our cities and their suburbs, and some half dozen sprinkled along in each country parish, there is very little done to improve the quality of horticultural productions, or to secure the rich bounty of a well cultivated garden. There are tens of thousands of wealthy farmers and mechanics in our nation, and many merchants and professional men, of whom it may be said, "They have scarcely a fixed inclosure for a garden;" or if they have what they denominate "a garden," we shall perceive neither order, proportion, or beauty, in it; but the sparse plants which are seen here and there struggling for superiority with the grasses which surround them, appear like *broadcast* from Chaos in its wildest freaks.

That these statements are substantially true is known to every reader of experience and observation, and many will unite in deprecating the continuance of the evil. That it is an evil will appear from the consideration that there is no portion of a man's farm that will yield him, in ordinary cases, one half the per cent. upon the labor and expense bestowed upon it, that a well chosen and well cultivated garden will afford him. This is a truth well attested by experience. Our deficiency then, in the art of Gardening, is an evil in point of economy. It is a national loss. Another consideration, showing it an evil, is that the *exercise* of gardening is greatly needed for the health and vigor of body and mind with very many persons of sedentary habits, and those who apply themselves intensely to their business, whatever the employment may be. The mind, like the bow, cannot always remain tense without losing its strength, and the body will suffer without change of action. These facts are familiar to most people, and the public attention has been called to consider them more particularly within the last four years. But change simply in the object of thought, or in the exercise of the body, without regard to the *nature* of those changes, will never meet the exigencies of the case; for the mind or the body, to exchange one task for another, will never afford more than a partial relief in case of fatigue with either. The change which the mind always demands in such cases is a suspension of intense thought, a letting-go of the subject of investigation, and turning to an object that is agreeable to the mind with the perfect freedom of giving to that object no more thought than it feels disposed to apply to it. The body is sensibly affected by the state of the mind; and to a very considerable extent, the interests of the body must be promoted by conforming its action to the state of the mind. And if these things are so, what employment in all the field of nature can promise more, as a general thing, to those who need a change of thought, and a change of action, as above described, than the art of Gardening? In the garden every man may apportion his exercise to his ability, extend his design to meet the time he will have to devote to that object, and at all times choose his hours for this species of manual diversion. Here he may mould every thing into his own judgment or fancy, compare and correct his own taste by the exhibitions of others, gather around him the beauties and excellencies of nature, and apply his labor to the production of those articles which are generally esteemed delicacies of the table, and, withal, consult the peculiarity of his own taste and that of his family. These remarks may be appropriate to persons in every calling in life, but more especially so to those who are not engaged in active and laborious exercises: I allude particularly to gentlemen in the three learned professions. And I wish to say in this connexion, that if these gentlemen were more generally the patrons of the art of Gardening, and were to make exhibitions of a refined taste in this department, their example would be salutary in this respect in all the towns and parishes where they reside.

There is another consideration which is in favor of gardening, and against the neglect of it: it is the influence which this will have in disciplining the mind to discover the fitness of things, to judge accurately of proportions, to discriminate between things naturally pleasing and those that are not, and, finally, to determine what is most excellent in natural objects.

It is said that a profound mathematician is a good logician. The reason is, the study of mathematics fits the mind for reasoning correctly. It is equally true, that a female who paints well will display a refined and correct taste in her dress, and in all her domestic establishment. She carries her improved taste in painting into all the actual scenes of life. For the same reason, probably, the man who displays good taste in his garden, displays it

in every thing else: on his farm, in his shop, and in his profession. But if his garden is the field of the sluggard, he is the sluggard in all other things, or it is generally the case. And if these things are all as I have stated them, then we shall all readily admit that the neglect of gardening in this country is an evil which calls for a remedy. And is it demanded of me to prescribe a remedy? This I will do without fee or charge. In the first place, to those who have never turned their attention to this branch of pleasing and profitable industry, and to those who have done next to nothing in this way, I would say, determine from this time on a reformation. Select your best piece of ground for this object, fence it, and prepare it in the best manner for a garden *this* year. Provide your seeds and roots, and exercise your best judgment and taste in the disposition of them in your garden. Take the advice of some of your more experienced neighbors, and feel determined that, with a common blessing, you will have a garden that will *invite* your friends into it, rather than repel them from it, when they visit your house. But as gardening is in its infancy in our country, and as great improvements are making every day in this art, it is very desirable that you should be in possession of some *periodical* upon horticulture, that you may reap the advantages of experience with others; and if you do not feel able to bear the whole expense of such a publication annually, unite with several of your neighbors in taking it, and once per month, spend an evening together in reading and communicating with each other upon this subject, and you will soon feel yourself richly compensated for the little time and expense you have bestowed upon this subject. But stop not here: if you have children, early initiate them into the sweets of gardening. As soon as they are old enough to exhibit taste in the choice and arrangement of roots and flowers, let each have his separate apartment, which is to be the object of his personal care, under your own general supervision; and if your *daughters* would come in for a share, either in beds or boxes, indulge them. It will have a happy influence on them in future life. You may yourself, as well as your partner, experience the good fruit of this early culture of the minds of your children, when to each of you the grasshopper has become a burthen, and the flowering of the almond tree shall be to you a monition that Eternity is near. N. N.

Hints and Suggestions to Farmers, No. VI. By B. [For the New-York Farmer and American Gardener's Magazine.]

Offices are created for the public, not for the incumbents. They nevertheless constitute fruitful rewards to merit; and, when spontaneously conferred, are among the highest honors that a free people can bestow. To *deserve* them is worthy of your ambition; but to *depend* upon them, as a means of livelihood, would be unreasonable and unwise, if not dangerous. A thirst for office is almost as bad as a thirst for rum. The more either are indulged the more craving they become. Every repetition of the potion but begets new desires, until, finally, the passion, in one case, terminates in *delirium tremens*, and, in the other, in *delirium candidatum*. I have known many a worthy man ruined in his usefulness and in his fortune, by this latter disease, and ultimately terminate his career under the complicated horrors of both maladies.

In selecting your public agents, adopt the same caution that prudence would suggest in your private affairs: choose those who are acquainted with the business in which you mean to employ them,—who know your wishes and your interests,—who have an established reputation for integrity,—and who have shown an ability to manage a public trust, by having conducted creditably and successfully their private affairs. Such men possess civil virtues, and merit civil rewards. But distrust the man who reiterates his importunities for your vote or your influence, as wanting either good habits or good principles. The first should render him independent of public aid, and the last should make him ashamed to ask for it.

Are we then to reject, as the bane of our happiness, the honors and emoluments of office? No; accept them, when proffered, as a mandate of duty, not as a source of wealth; as a compliment to your merit, and as the requital of an obligation which you owe to society. Accepted in this spirit the duties will not seem onerous, nor the emoluments worthy your exclusive regard. And when you have enjoyed the honors, and fulfilled the duties, abandon neither your politics nor your religion, because your fellow citizens happen to discover in your neighbor qualities and merits equal or superior to your own. The spirit of a free government forbids monopoly. Whether they impose a duty, or confer honor or profit, offices should be shared by those who are capable and worthy; and I do not know of a more salutary provision which would be engrafted on our constitution, than that which has been thrice forcibly recommended by our illustrious President, to limit the tenure of office to some definite period of time.

I will close this number with the history of a schoolmate:—*Job Allerton* commenced life under the most flattering auspices. His farm was a pattern of neatness—fields well cultivated, cattle in fine order, and fences and buildings in good repair. Job owed no man, and had accumulated a fine sum at interest. His children were growing up under their parent's example in habits of industry, and promised to become respectable in society. Every thing throve under his care, and he was pointed to by all as the best farmer in the town of S. His good qualities, and the influence which these procured him, at length brought him into political notice, and he became a successful candidate, very much against his will, for the Assembly. He returned from Albany in the spring, with some new notions, but the habits of the farmer still predominated. To a second nomination Job had less objection, nay, he secretly intrigued for it, for he thought, as he remarked, he was *then* qualified to do some good. The second triumph, and the consequence it gave him at the dinners and parties in the renowned capital turned his head, and he came home quite an altered man. It was no longer "*come, boys,*" with him. Politics engrossed his whole attention. He became a standing candidate for every office that presented; and was in succession—sheriff, senator, and member of Congress.

In the mean time the farm began to show the absence of the master: the fences were prostrate, the cattle neglected, and the buildings verging to ruin. The boys too, as boys ever will, aped the father, began to strut the gentleman, and to look up for office and dignities. As industry departed prodigality entered, and soon wasted the frugal earnings of former years. At length the illusion vanished, Allerton found himself deeply in debt, without means *and without office*, with an indolent, extravagant family to support. Offices had ruined him. In his distress he mustered resolution to do what hundreds have failed to do, and who have done worse. With the wreck of a former competence, he pulled up stakes, and leaving behind him his official habits and official pride, fled to the wilds of Indiana, where, I am happy to say, he has resumed again the habiliments of the farmer, and is profiting by the lessons of experience.

Who is there that among his acquaintance does not recognize a Job Allerton? B.

[Remarks.—Let none of our readers suppose B., in his excellent article above, would dissuade farmers from studiously qualifying themselves for the discharge of office within the gift of people. The doctrine he advocates is similar to that in the following sentence: "In ancient times, Pliny observes, the lands were cultivated by the hands even of generals, and the earth delighted to be ploughed with a share adorned with laurels, and by a ploughman who had been honored with a triumph."—Ed.]

Absorbent Properties of Potash—Ploughing in Dry Weather. By R. M. W. [For the New-York Farmer and American Gardener's Magazine.]

Mr. Fleet,—I am not quite done with the subject of ploughing and hoeing in dry weather. From the remarks made on potash, vol. 5, page 321, of the Farmer, two things may be inferred: 1st, that it takes 14 pounds of water to dissolve one pound of potash, and consequently that it will take 7000 pounds of water to dissolve an ordinary barrel of 500 pounds of potash. This is the least quantity of water in which a barrel of potash can be dissolved. Many years ago, a boat was loaded on Cayuga lake with 56 barrels of potash. On the Oneida lake they met with a squall, were driven ashore and sunk. The potash barrels being leaky, and remaining in the water from half an hour to an hour and a half, took in as much water as they would contain. This water swelled the barrels so that they became tight. In this situation the captain procured two potash kettles with tubs, wood, and other articles, with a view of dissolving, boiling down, and melting, the whole of the 56 barrels. The circumstances being mentioned to me, I observed that the boiling would be unnecessary, as the potash in the barrels would soon absorb all the water, which could not exceed 10 gallons to the barrel, and the potash would pass inspection without melting over, and consequently save the expense of boiling, melting, &c. The 10 gallons of water could not weigh over 90 pounds, whereas it would take 7000 pounds to dissolve it. The experiment was tried and the potash was sent to market for inspection, and was sold as *first sort*, so that the expense of boiling away 392,000 pounds of water, and all the other expenses of such an undertaking, were saved.

From this it will appear that it is not altogether useless to know how many pounds of water will dissolve one pound of potash. The atmosphere holds much moisture, or water dissolved in caloric, as is evident from

the circumstance mentioned page 321, vol. 5, of the Farmer. Another experiment will serve to demonstrate the same fact. Take a tumbler, fill it with cold water, set it on a table in warm weather, and in a few minutes the tumbler will be covered with a dew. This experiment is easily tried, and the rationale I take to be as follows: Caloric always seeks an equilibrium; it passes through the tumbler, and combines with the cold water until the water is brought to the temperature of the air. The water held in solution is deposited on the outside of the tumbler, and this circumstance will occur in the driest weather. It would seem then demonstrated, that the atmosphere holds in solution much moisture, and though invisible to us it is still large in quantity. Now let us apply this doctrine to ploughing and hoeing in dry weather. Where land is left unploughed, unhoed, and covered with grass and weeds, the crops are seen to dwindle; stir the ground, and they speedily revive. By ploughing and hoeing, the grass and weeds are destroyed, and the earth becomes a powerful absorbent, drawing the moisture of the atmosphere into the neighborhood of the plants. The capillary vessels of plants seize this moisture; it reaches the roots and sustains them in a flourishing condition, even in the driest weather. The moment this moisture is condensed, it can no longer enter the capillary vessels of plants. This probably carries with it much food, and is every way necessary to the well being of the plants; so I think, and remain yours, &c.

R. M. W.

Middlesex, Feb. 15, 1833.

Retrospective Criticisms on the First Series of the New-York Farmer. By the EDITOR. Vol. I. No. IV, 1828. [Continued from page 106.]

ORCHARD IN MINIATURE.—By the selection of the stocks of the Paradise Apple, or the French paradise or doucin, an orchard of dwarf trees, that will occupy no more ground than gooseberries, may be obtained. The quincunx method is most generally adopted.

DEAD HORSES IN PARIS.—The late Dr. S. L. Mitchill gives in No. IV. an abridged translation of a work on the removal and uses of dead horses. Twelve thousand seven hundred and seventy-five old worn-out horses were cut up in one year, in only two of the establishments. There are numerous uses made of the dead horse. The hair of the mane and tail is sold to the manufacturers; the skin to the tanners; the flesh of those that die healthy and fat is eaten by the lower classes of the inhabitants, and that of others is carried into the city and sold for food for wild beasts, dogs and cats; the entrails are principally sold for manure; the tendons are purchased by the manufacturers of glue; the fat is collected with great care and used for various purposes; the shoes and nails are sold for old iron; the hoofs are used for combs or sold to the manufacturers of volatile alkali and Prussian blue; a portion of the bones are used by cutlers, toymen, and fan-makers. The vast quantities of entrails draw immense numbers of flies, which soon convert the large heaps into moving masses of maggots. These are sold by measure to fishermen for bait, and to others as food for birds and poultry. The flies attract myriads of swallows, and the swallows sportsmen. The rats are so numerous that they undermine and throw down the buildings, and several thousands are killed in an evening's hunt.

Effects and Expediency of bestowing Premiums by Agricultural Associations. By the EDITOR.

At this time, when it is to be hoped the people of the United States, particularly of the state of New-York, are about to give a united effort to raise the condition of agriculture, it is important to have all the means by which the object is to be obtained fully investigated. One of the principal means used by those who are engaged in promoting this great and patriotic undertaking, is the bestowing of premiums. It is well known rewards of merit and approbation have an exciting effect upon persons of all classes and of all ages. When they are so bestowed that no contrast is drawn, and no reflection of inferiority made, or rather when there is no difficulty in making the discrimination, it would seem that the effects could not be otherwise than beneficial. But wherever excitement exists, there, owing to the imperfection of mankind, will be exhibited many of the dark passions as well as bright virtues that form the human character. It is well known to most of the people of this state, that much, if not all opposition to the former grand plan of agricultural associations, arose from the dissatisfaction respecting the premiums.

We throw out the above remarks in hopes that our correspondents will furnish us with facts and their views. We should be pleased to see some able pen take up this subject. In the mean time we invite the attention of our readers to the following article on the best Motives in Education, from the American Annals of Education. Although relating to youth, yet the whole spirit of the piece is appropriate to our subject—men being nothing more than large children.

"MR. WOODBRIDGE,—You write to request a statement of my experience on the subject of *emulation*. Your first inquiry is: "Have you seen any bad effects from the principle of emulation, and what are they?" In reply to this I would state, that, when I first commenced the duties of an instructor, I was entirely persuaded of the propriety of employing this principle in stimulating to exertion, and convinced that I never could succeed without its aid. I felt that it involved evils, but that they were *necessary* evils, such as were always to be expected with whatever is *good*.

Lest my remarks should be misunderstood, for want of a distinct notion of what I mean by *employing the principle of emulation*, I would state that I mean all methods of exciting others to exertion by rewards and punishment based on *comparative excellence*. It is giving rewards to those who are decided *to be better than their companions*, in any of those particulars for which rewards are offered. The following are some of the evils I have experienced:

In reference to those who are most affected by it, this kind of stimulus often produces *too high a degree of excitement*. There are always, in every collection of youth, some who are naturally more desirous of admiration and esteem than others—a class of minds usually denominated *ambitious*. Such need to have this tendency repressed, instead of strengthened. They need to form a habit of acting from *higher* motives.

Yet these are the very ones who inevitably are most affected by the appeals to the principle of emulation. Such minds I have sometimes observed to be so much influenced that all other motives seemed for the time being to lose their influence; and this, too, in circumstances where the ordinary class of minds would be but little affected.

Another difficulty has been experienced in the *limited extent* to which this method of exciting can reach. I have never been able to devise any method by which the indolent, unambitious, timid, and dull pupils, (those who certainly most need stimulus,) could be reached. Emulation always affects those the most who least need excitement, and leaves unaffected those who most require it. A third evil is, that it renders those who come under the influence of this principle *less susceptible of better influence*. I have ever found that children *form habits* in this particular. If a child is wont to have appeals made to his *affections* and to his *conscience*, he forms a habit of acting on these principles—if, on the contrary, appeals are made to ambitious motives, he forms a habit of acting under their influence.

A fourth evil has been, the envy, jealousy, suspicion, and temptation to deceit, which always have been experienced, to a greater or less degree. Unwearied efforts have been made to counteract and prevent such evils. But they always *have* existed, and in an exact proportion to the degree in which this kind of stimulus has been applied; and whatever others may be able to effect, years of experience have taught me to despair of disconnecting such evils with this kind of excitement.

At the same time, there will always be *a sense of injustice*, and a feeling of distrust and alienation called forth towards the teachers who decide the relative merits of competitors. It is impossible so to adjust rules and accounts, that there will never be occasion to suspect partiality. Teachers and pupils will never form exactly the same opinions in all given cases, at the time the decisions of rewards are made. There will always be occasions of suspicion and complaint. I never yet so succeeded, on such occasions, as that these evils were not to a greater or less extent the inevitable result, and yet the most unwearied pains have been taken to impress the pupils with correct views of their duty on such occasions, as well as to give them no just cause for such complaints. Those pupils who are too magnanimous to feel personally injured, are the ones who feel most sensitive to any apparent injustice to their friends.

The last evil I would mention is that sacrifice of the *moral* interest to the *intellectual*, which is involved in the use of this principle.

The great object of education is *to form the disposition, habits, and conscience*, and the mere acquisition of knowledge is but a minor consideration. All the *benefits* I have ever discovered in employing this principle have been in reference to intellectual improvement. The *evils* have had a much more important and extensive range, for which nothing can be an equivalent, when moral are placed before intellectual benefits. These are the evils I have actually found from experience. How much they have resulted from the defective nature of the principle itself, and how much from the want of judgment in employing it, it is not for me to decide. I can only say that it has been a prominent object of interest, to purify it from evils and make it only good, and that after years of trial I have felt bound to banish it entirely as a dangerous and needless principle in education.

Your second inquiry is, "Have you found other motives equally efficient, and what are they?"

In reply to this I would say, that I have been able to secure motives not only *equally*, but *much more* efficient, in reference to all the objects to be gained in education.

Among these I would first mention,

Personal influence. If the esteem, the affection, and the confidence of pupils can be gained, a great amount of motive is placed at the command of a teacher. A desire to please, the fear of grieving a sincere friend, the apprehension of a loss of confidence and affection, the fear of remonstrance from one who is respected and esteemed, have very great weight in all

such cases. It is only needful to convince the pupil that a teacher is really a sincere friend, is worthy of respect and esteem, and is faithful in observing and recording deficiencies, to secure an influence which is always salutary, and never injurious. In this connection, however, I would remark, that *commendation for improvement* needs to be practised much more frequently than reproof for deficiency. Hope and encouragement is a better tonic than fear and reproof.

A second method is by habitual appeals to *the Bible* as the rule of rectitude, and to *conscience* as the judge. It is certainly a fact that persevering in such a practice will strengthen the influence of conscience, and sometimes almost *make one* when it has seemed well nigh extinct. A child who is constantly treated as if it was expected he should act with reference to the true rule of duty, and in obedience to conscience, will gradually acquire a habit of thus acting.

A third method is by cultivating a love of knowledge for its own sake (that is, for the pleasure it imparts), and also for the sake of the increased good it will enable us to do to our fellow beings. Children can be made to feel the excellence of living to do good, and can be interested in acquiring knowledge, with this object in view.

A fourth method has been by efforts to form a correct public sentiment in school, so that it shall be unpopular to do wrong. If this can be done, it brings a strong influence over every member of the community, and operates beneficially, and without any re-acting evils. This is accomplished by impressing these responsibilities in this respect on the school in general, and on the most influential pupils, in particular; and in *confiding* in them, and instructing them *how* to aid their teachers, in thus benefiting their companions.

Another method is by appeals to parental influence and that of other friends. This is accomplished by transmitting frequent accounts, both of deficiencies and improvement, to the friends of the pupils. The certainty that those they love, are watching all their course, and will certainly know both when they are negligent and when they improve, has a constant and only useful influence.

The last method I will mention, and the most certain and permanent, is by cultivating in the pupils a sense of obligation to God, of his constant inspection, and of his interest in all their concerns. This is a principle which gains strength the more it is appealed to, and is of course good and only good in its operation.

These are the principles upon which I have chiefly depended, during the last three or four years of my experience as a teacher. Every year has added to my conviction of their efficacy, and every year has increased my satisfaction that the principle of emulation which has caused me so much perplexity and trouble, has been banished with no consequent evil and much increase of good.

If my experience can be of any use in settling a question of such paramount interest, it will be a matter of real satisfaction—and, whatever you find in this statement, which in your judgment is calculated to this end, is at your service. Respectfully yours,

C. E. Beecher.

Raising Horses, Cattle, and other Live Stock.

By Suffolk County. To the Editor of the New-York Farmer.

Sir,—As the season is approaching when we expect to increase and multiply our live stock, permit me to present to your readers some of the directions that are appropriate to the subject.

The eminent surgeon, Henry Cline, Esq. of London, has given the world his views, from which I glean the following summary of doctrine. The external form is considered an indication of the internal structure. On the size and soundness of the lungs the health and strength of the animal principally depend. The size of the lungs is indicated by the form and size of the chest, particularly its breadth. The head should be small, to facilitate the birth. According to the size of the animal should be the length of the neck, that it may collect its food. For strength and travelling, the muscles and tendons should be large. Mr. Cline supposes bones disproportionably large to indicate an imperfection in the organs of nutrition, and by no means to imply great strength.

Those breeds of stock are to be preferred that have a regular and pretty rapid growth. To be stationary or slow in growth, implies disease or disordered functions, and is seldom attended with beauty and compactness of form. Those breeds that have the property of growing are generally straight in their back and belly. Although we do not want much belly, yet gauntness or paucity of intestines bespeak a material defect. Hardy, healthy constitutions, arriving soon at perfection, not only in size but in fatness, prolificness, quality of flesh, lightness of offal, gentleness, as well as other properties, are to be brought into view.

Yours, &c. Suffolk County.

April, 1833.

Suggestions relative to Farmers' Work for May.

By the Editor.

Soiling.—It is stated on good authority, that a grass meadow in good heart, mown and eaten green, will, at a rough estimate, produce treble the quantity of milk it would have if pastured, and four times as much as it would have done in the form of dry hay.

Salt.—At this season of the year, when live stock are changed from dry hay to green pasturage, the effect on them is very considerable. Their offal, from being comparatively dry and hard, immediately becomes of a liquid consistency. To prevent this sudden weakening effect, give a little salt dissolved in a little bran or meal and water, which will greatly increase the thriving of the cattle. In Germany portable sheds are put up in the fields for shelter, with salt constantly kept in a suitable vessel. A few quarts of bran wet and salted, and given to cows two or three times a week when they are turned to grass, will yield a great per centage of gain in milk.

Irrigation.—Every farmer should have in his yard a cistern, or some similar receptacle for his liquid manure. In our often dry and burning climate, watering grass and other crops would be the means not only of keeping the crops in a growing state until they are supplied with rain, but greatly enrich the land.

Kinds of Crop.—Farmers should not be guided much in the choice of crops for culture, from the high prices they now bear in market. They may, very probably, by the time they are able to get the crops in market, become reversed in prices. Potatoes, for instance, command a poor price; and for this reason a farmer who has to buy his seed, should plant more potatoes than if they were dear.

Weeds.—Every farmer should make it a principle of duty to eradicate every useless weed, not only from the injury he may sustain, but from regard to his neighbor and the public. A few seeds from his field may be carried by the wind into those of his careless neighbor, and thus eventually a whole neighborhood become invested.

Fruit Trees.—Grafted trees should be examined, and the clay or composition fallen off supplied. Useless suckers and side shoots ought to be removed. In some instances, when the suckers have roots, they should be set out for stocks. Young fruit trees, sprouting up about the fields should be taken up and put in the nursery or portion of garden allotted for that purpose.

To have your orchard trees to continue thrifty, particularly young ones, it is advisable to have the ground for one or two feet around the body kept free from grass, every spring manured, and stirred several times in the course of the summer.

Root Culture.—There are many advantages arising from the cultivation of roots. From not ripening their seeds they are considered not to exhaust the soil as much as those that do ripen them. The soil becomes stirred and comminuted, and thus is fully exposed to the air. Weeds and poor grasses are more effectually destroyed. These crops are very productive. Potatoes averaging from 3 to 4 hundred bushels per acre, and turnips, ruta baga, mangel wurtzel, carrots, &c. from 6 to 8 or 9 hundred. They serve to alternate, and give variety to food for cattle in winter. Turnips are considered the best. The seeds cost but little, are sown with trifling trouble, require but little culture, remain on the ground but a short time, are eaten by man and beast, and easily preserved over the winter. The seed of the mangel wurtzel is sown early in May, and costs from 75 cents to $1.25 per pound. Four or five pounds are required to the acre. These raised for seed would, we should suppose, make good returns.

Squashes and Pumpkins.—No farmer should neglect to have a liberal supply of these. They are of much service in various preparations on the table, as well as feed to hogs and cattle. Raised in hills, on ridges of manure covered lightly with soil, they succeed well, although they generally make good returns on almost any soils. Sometimes a portion of the cow-yard, or where there has been a dunghill, may be profitably occupied, by mixing heaps of sand or soil with the scrapings.

Forest Trees from Seeds.—Farmers should remember that there are many forest trees raised from seed that will sell well, and that are valuable for timber or fruit. Among these are the juglans squamosa, or shagbark hickory, and the j. regia, or Madeira nut. These trees, when two or three years old, will, in almost any neighborhood, sell for remunerating prices. Early in May is not too late to sow forest seeds.

Preventives of injury from Insects.—Many farmers lose many of their crops by grubs and other insects. Cucumber, squash, melon, and pumpkin vines, as well as turnips, are often destroyed by insects. To guard against them, the farmer should be provided with coarse tobacco leaves, soot, dry ashes, and the like.

Agricultural Works.—However well farmers may think they understand their business, yet they would derive benefit from having a work on agriculture, to which they could refer in reference to every operation on the farm. They would always find some hint or suggestion that would be more or less important. The physician, lawyer, and clergyman, think, and justly too, that they can

not fill their stations without a library of books for reference. Is farming a calling so much lower that not a single volume is at all necessary?

EXPENSIVE LABOR.—Many, after toiling for many years, find their hired help has consumed all their profits. Farmers thus situated should endeavor to alter or vary their plans of management, that they may introduce a system of culture that will be equally productive with less labor. By duly considering all the circumstances in which they are placed, nine times in ten they will be able to make the desired change, without risk.

IMPROVEMENTS.—Every farmer should study out a plan of improving the value of his farm, and should persevere and follow it out, but be careful to avoid undertaking them any faster than he has means and time. If possible, always make the profits of the farm pay for the improvements.

MANURE.—Much has been said about long and short manure. When put on in spring, it is reasonable to suppose that it ought to be in a state of insipient fermentation at least. If not, the plant acquires more or less of its growth before it is sufficiently fermented and dissolved to be of service; and when it is in a state fit to nourish the plant, it produces an unnatural stimulus, at an improper time, causing the plant to run into leaf, straw or wood, when it should form or ripen fruit.

The Connoisseur, No. I. By GUSTO. [For the New-York Farmer.]

MR. FLEET,—I can vouch for the truth of the following anecdotes, which, as they tend to show the infallibility of us denizens, may not be wholly uninteresting to your readers:

Many years ago, a merchant of Savannah, in Georgia, had a call for some wine from May-River, South Carolina. The planter had lost most of his crop of cotton by the caterpillar, and told the merchant that he wanted five gallons of Teneriffe wine. He left his demijohn, and departed. Directly came in another planter from the same quarter, with his demijohn: he wanted five gallons of Sherry wine, and departed also. Shortly after these, came in another planter with his demijohn: he wanted five gallons of Madeira wine; left his demijohn and went away. The merchant went to drawing the wine, and filled the three demijohns out of the same cask. Being asked if he drew three kinds of wine from one cask, he answered, "Huss! huss! mynheer W. I tell you how it is. The first planter was poor, he lose his crop, and wants cheap wine, so I draw Teneriffe, and charge him two dollars. The second planter lose only part of his crop, so I draw and charge him three dollars. The other planter feel rich, he want Madeira wine, so I draw and charge him five dollars. Neber mind, neber mind, mynheer W.; all go well!" Yours, &c. GUSTO.

No. II.

MR. FLEET,—Many years ago a brig was loaded at Philadelphia, and on arriving at Savannah advertised English Cheese for sale. The connoisseurs collected in flocks to examine the article, they pronounced it to be good English Cheese, and not only good but very good: the consequence was that the cheese was sold readily at seventy-five cents a pound.

Some months after, the same vessel arrived with cheese, the consignee advertised Block Island cheese, from a noted cheese-seller of Philadelphia. The charm of English cheese was broken, and the article was a drug at fifteen cents. Nobody could taste the goats' milk on it any longer. Yours, &c. GUSTO.

No. III.

MR. FLEET,—Many years ago a merchant in Savannah had a quantity of grape jelly, which was a perfect drug at twenty-five cents a jar. He scoured off the mark of Grape Jelly, and wrote on, in lieu thereof, *Venison Sauce*, and the article was sent to auction, and sold readily at from four and a half to five and a half dollars the dozen. When called venison sauce it was found very good, but when called simply grape jelly, it was good for nothing. It is very certain, therefore, that there is no disputing about tastes.

Yours, &c. GUSTO.

No. IV.

MR. FLEET,—Many years ago a merchant imported a large quantity of pickled walnuts, which, with the importation and duties, netted him a very small profit at four and a half dollars the quart; he pickled our butternuts, and found them just as good as the English walnut, and when made into catsup were esteemed better and fresher by the connoisseurs, and if they had not been much cheaper, no doubt they would have taken the place of the imported article, but they were too cheap to sell well.

Yours, &c. GUSTO.

April 12, 1833.

Cutting and Nicking the Tails of Horses. By HUMANITY. [For the New-York Farmer.]

MR. EDITOR—I am extremely sorry to see that short or bob-tail horses are again coming into fashion—fashion, a cruel unrelenting monster, foe to the brute creation as well as to human beings. What person, whose idea of beauty is not strangely perverted, can prefer a mutilated horse to one with all his members entire! Independent of the sacrifice of beauty, the suffering which horses endure from flies is sufficient to arrest the hand of every one who attempts to shorten the tail of a horse, and who has the least feeling of humanity.

The nicking of horses is another cruel fashion. A nicked horse is considered by Mr. Wm. Carver, who is one of the oldest and most experienced farriers in this country, to be reduced in value twenty-five per cent. I send you the following extract from a book on farriery, giving the best of three modes of nicking. The reading of it is sufficient to deter any one having a horse from inflicting so much cruelty. Yours, &c.

HUMANITY.

New-Jersey, April, 1833.

"Being provided with a sharp knife and a crooked piece of buck's horn, and the tail being turned up by a strong arm, in a direct line with the back bone, as before mentioned, commence the operation by making a transverse incision, immediately across the tail, one and a half inches from the root, and deep enough to separate entirely the tendons on each side of the under part of the tail, which will be found about a quarter of an inch from the hair on the outer edge; this incision in the middle may be shallow. The large arteries lie so immediately under the tendons, that they are often wounded or separated in performing this operation, which will be a great advantage in the healing of the wounds, instead of doing injury by the loss of blood. But whenever a horse may have bled from one to two gallons, the bleeding will readily stop, by placing the tail in pulleys, or by applying a small quantity of flour and salt to the wound, and wrap the tail up moderately tight with a linen rag, from the root to the end.

Make two incisions lengthwise or longitudinally, (commencing about two or two and an half inches from the cross or transverse incision,) and about three inches in length, which will expose the large tendons on each side.

Make two other incisions of the same kind, commencing about one inch from the second, and in length, running within about two inches of the end of the tail.

Make a transverse incision within half an inch of the termination of the longitudinal incisions, (or those made lengthwise,) pretty deep.

With a buck's horn take up the large tendons in the second incisions, and draw the ends out of the first; take up those in the third and draw the ends out of the second, and at the upper part of the wound cut off the tendons even and smooth.

With a strong arm strain up the tail opposite the second incisions, until the bone slips or breaks; treat the tail opposite the third incision in the same manner—also the fourth and last, which should be made across.

Wash the tail in strong salt water, and the horse may be placed in a stall, turned in a pasture, or elsewhere, for two or three days.

Wash the wounds and tail clean with strong soap suds, and place the horse in the pulleys, by passing the small noose (*figure* 1) over the stick confined in the hair, at the end of the tail (*figure* 4.) [A plate is given.]

Take from the neck vein half a gallon of blood, each week, until he gets well—or double the quantity, should the tail be much inflamed. He should remain in the pulleys about three weeks," &c.

REMARKS.—Cannot some other method of improving the carriage of the tail be found out. A nicked tail, in our eye, always looks stiff. We should be glad to have the remarks of some of our correspondents on this subject.

Trees in Market—Bad Economy. By the EDITOR.

On the 24th of April we bought in the market near one hundred peach and cherry trees, from five to ten feet high, for the sum of *seventy-five cents*. They were labelled for good varieties, and had been dug up about a week—sent to market by a farmer on Long Island. Not the least dirt was attached to their roots, which had been exposed to the drying sun for five or six days, without any covering or protection. There were four bundles, the freight and carriage of which amounted to one dollar. Independent of all the trouble and expense of raising and digging up the trees, the farmer lost twenty-five cents, besides the commission for selling them. His agent had been offered 12½ cents a piece, when they first arrived, but was limited to 15 cents. Had the farmer snugly tied the roots up in matting or straw, either with or without any soil adhering to them, he might have realized ten to fifteen dollars for his trees. Twenty minutes would have enabled him to secure his trees so that they could have remained in market three or four weeks uninjured. Nearly all the fruit and ornamental trees in market, sent by farmers, were in the same condition.

Unless farmers will take more pains in raising good varieties, and carefully packing the trees, they never need expect encouragement. Our citizens will give more for a single good tree from a nursery, properly taken up and packed, than they would for hundreds in a mutilated, wilted, and more than half-dead condition.

Suggestions relative to Gardeners' Work for May. By the EDITOR.

Not a moment is to be lost this month. No one who is desirous of having his garden well stocked with the best of vegetables, and all in good order, will hesitate to devote the extra time which is requisite to have all his plans and operations carried into full effect.

Beans.—The Dwarf Kidney varieties may be planted throughout this month, and until August, for succession crops. Pole beans may also be put in the ground until June. The Carolina and Lima beans are not, except in very favorable locations, planted until the middle of May. Beans do well on a light soil, except the Lima, which require one considerably enriched.

Beets.—Should the first sowing fail, the seeds may be again put in the ground the first of June.

Borecole and Brussels Sprouts are sown middle of May, and transplanted in July into good ground, in a warm situation.

Brocoli.—The seeds of the purple brocoli may be sown about the middle of May; when of proper size, transplanted into rich ground.

Cauliflower.—The seeds may be sown early in May, and the young plants set out in the latter part of June in very good soil.

Cabbages.—The seeds of Savoy, late kinds, and red, are sown early this month.

Cucumbers.—The varieties to be planted this month are Early Frame, Green Cluster, and Long Prickley.

Corn.—Indian corn, the early varieties, should be planted to be eaten green.

Herbs.—The various kinds of medicinal, pot, and aromatic herbs may be sown. Many of these are not only very useful but saleable.

Melons.—The delicious nutmeg, musk, and water melons are to have a place this month. Sometimes it is necessary to thin the vines, and to pinch off their ends to increase their fruitfulness.

Okra.—Sow in drills near two inches deep and four feet apart.

Peppers.—The different kinds of pepper are sown in a good soil this month.

Peas.—For succession crops, sow this month. To have them come up soon, soak them six to twelve hours. A little milk put in the water is said to cause the bugs to come out of them. Peas are said not to succeed as well with fresh unrotted manure.

Pumpkins.—This valuable vegetable is a profitable crop on almost any soil, particularly on one light and moderately enriched.

Sorrel.—The broad and the round leaved sorrel may be sown this month, in beds or along borders, and when of some height, thinned out to the distance of nine inches.

New-Zealand Spinage.—Plant two seeds in a hill. It is of a luxuriant growth, and stands the heat of summer, at which season it is fit for use.

Squashes.—The early bush squashes are considered the best for gardens. The Vegetable Marrow, and the Cocoa nut Squash, are among the desirable varieties. Five or six seeds in a hill, and the vines reduced to three.

Strawberries.—Most writers recommend a few of the male or barren plants to be set out with the bearing ones. Mr. Floy, of New-York, advises the rejection of all those that are unproductive. By pinching off the runners their bearing is increased.

Taste and Order.—The vegetable garden admits of some display of taste as well as of neatness and cleanliness. The substitution of circles and other figures for squares or oblong beds, and the training on neat trellis work, is sometimes admirable. Letting peas and beans run up on wires or twine, is much neater than bushes or poles. For peas, drive in a neatly painted stake or stick at each end of the rows, and as many intermediate ones as are necessary; extend the twine along these at different heights for the vines.

For further particulars it may be advisable to refer to the Suggestions of last month, page 107.

We cannot do our readers a better service than to furnish them the following summary directions from the "Young Gardener's Assistant," by T. Bridgeman, the fourth improved edition of which is just published:

"Previous to entering on the work of the garden, the gardener should lay down rules for his future government. In order to this, he should provide himself with a blank-book. In this book he should first lay out a plan of his garden, allotting a place for all the different kinds of vegetables he intends to cultivate. As he proceeds in the business of planting his grounds, if he were to keep an account of every thing he does relative to his garden, he would soon obtain some knowledge of the art. This the writer has done for the last twelve years, and he flatters himself that a publication of the results of his practice will be interesting and useful to his readers.

"If gardeners were to make it a rule to record the dates and particulars of their transactions relative to tillage and planting, &c., they would always know when to expect their seeds to come up, and how to regulate their crops for succession; and, when it is considered that plants of the BRASSICA or Cabbage tribe are apt to get infected at the roots if too frequently planted in the same ground, and that a rotation of crops in general is beneficial, it will appear evident that a complete register of every thing relative to culture is essential to the well-being of a garden.

"One great article to be attended to is to have a supply of good old manure and other composts ready to incorporate with the earth; also a portion of ashes, soot, tobacco dust and lime, for the purpose of sowing over seed beds in dry weather: this will tend in a great measure to destroy insects, which sometimes cut off the young plants as fast as they come up.

"If the ground cannot be manured every year as it should be, it is of primary importance that those vegetables be provided for which most need manure. A perusal of the catalogue will enable the young gardener to judge of the kinds of garden products which require most. Lest I should not have been explicit enough in this particular, I would inform him that good rich manure is indispensably necessary for the production of Brocoli, Cauliflower, Cabbage, Lettuce, Spinage, Onions, Radishes, and Salads in general.

"In the event of a scanty supply of manure, those kinds of vegetables which are raised in hills or drills may be provided for by disposing of the manure immediately under the seeds or plants.

"The next important matter is to have ground in suitable condition to receive the seed. I would wish it to be understood that I am an advocate for early sowing and planting, even at the risk of losing a little seed, provided the ground be fit to receive it. A light sandy soil will be benefitted if worked when moist, as such treatment will have a tendency to make it more compact; on the contrary, if a clay soil be worked when too wet, it kneads like dough, and never fails to bind when drought follows, and this not only prevents the seeds from rising, but injures the plants materially in their subsequent growth, by its becoming impervious to the moderate rains, dews, air, and influence of the sun, all which are necessary to the promotion of vegetation.

"Much depends on the manures used on particular kinds of soils. The great art of improving sandy and clayey soils, is to give the former such dressings of clay, cow dung, and other kinds of manure, as will have a tendency to bind and make them more compact, and consequently more retentive of moisture; and to the latter, coats of horse dung, ashes, sand, and such other composts as may tend to separate the particles and open the pores of the clay, so as to cause it to approach as near as possible to a loam.

"The nearer the ground approaches to a sandy soil, the less retentive will it be of moisture; the more to a clayey, the longer will it retain it; and the finer the particles of which the clay is composed, the more tenacious will it be of water, and consequently be longer in drying, and the harder when dry; but earth of a consistence that will hold water the longest, (without becoming hard when dry,) is that of all others the best adapted for raising the generality of plants in the greatest perfection. This last described soil is called loam, and is a medium earth, between the extremes of clay and sand.

"I have in most cases recommended drills to be made at certain depths for the different kinds of seeds, and when I have stated that the drills should be two inches deep, it is intended that the seeds should be covered only one inch, which they will be when planted in these drills and covered—and so in proportion for any other depth required. This may serve as a guide to the young gardener, but circumstances alter cases; if, for instance, some particular crops should fail, this would render it necessary, if the season be far advanced, to risk a further planting of seeds, even if the weather be hot and the ground dry; if these be planted a little deeper, they may escape the violent heat of the sun, and in the event of a shower, the ground would become sufficiently moist to bring them up; whereas, it sometimes happens, that seed sown after a shower do not vegetate until after the season is too far advanced to bring the crop to perfection.

"The work of drilling may be performed in various ways; in some cases a plough is used, in others a small hoe, or a dibble drawn along the edge of a board or line; it is of little consequence which way the work is done, if it be well done. While I leave the gardener to make his own choice of tools, I would suggest that he be provided with two or three drilling machines; these, every handy man may make for himself; they should be in the form of a garden rake, with a stout heavy back and five teeth two inches broad, and tapered so as to enter the ground and leave drills two inches deep. If one be made with the teeth eight inches apart, another twelve, and another fourteen, they will be useful in making drills for various seeds, and drills thus made serve instead of straining a line, for every row in planting Cabbage, Lettuce, Leeks, &c., the line being strained at one edge of the bed, and the drilling machine drawn straight by the line, makes five drills at once. If they are straight they may be kept so, by keeping one drill open for the outside tooth to work in until the ground be all drilled.

"Gardeners practise different methods of covering up seeds, some do it with a hoe, others with a rake or harrow; some draw a portion of the earth to the side of the bed, and after sowing

the seeds, return it regularly over the bed; in some particular cases a sieve is used, in others a roller. Rolling or treading in seeds is necessary in dry seasons, but it should never be done when the ground is wet.

"There is nothing that protects young crops of Turnips, Cabbages and other small plants from the depredations of the fly, so well as rolling; for when the surface is rendered completely smooth, these insects are deprived of the harbor they would otherwise have under the clods and small lumps of earth. This method will be found more effectual than soaking the seed in any preparation, or dusting the plants with any composition whatever; but as the roller must only be used previous to, or at the time of sowing the seed, and not even then if the ground be wet, it is necessary that the gardener should have a hogshead always at hand in dry weather containing infusions made of waste tobacco, lime, soot, cow dung, elder, burdock leaves, &c. A portion of these ingredients, or any other preparation that is pernicious or poisonous to insects, without injuring the plants, thrown into a hogshead kept filled up with water, if used moderately over beds of young plants in dry weather, would, in almost every case, insure a successful crop.

"As liquid, however, cannot be conveniently used on a large piece of land, it may be necessary, if insects are numerous, to sow tobacco dust, mixed with road dust, soot, ashes, lime, or the dust of charcoal, in the proportion of half a bushel per acre, every morning, until the plants are free or secure from their attacks. Turnip seed will sometimes sprout in forty-eight hours; Cabbage seed ought to come up within a week after it is sown, but it sometimes happens that the whole is destroyed before a plant is seen above ground: the seedsman, in this case, is often blamed without a cause. A correspondent has communicated the results of an experiment he has tried for preventing the attacks of flies or fleas on Turnips. He says, steep your seeds in a pint of warm water for two hours, in which is infused one ounce of saltpetre; then dry the seed and add currier's oil sufficient to wet the whole, after which mix it with plaster of Paris so as to separate and render it fit for sowing.

"In the summer season, Brocoli, Cabbage, Cauliflower, &c., are particularly subject to the ravages of grubs and caterpillars; to prevent this wholly is perhaps impossible, but it is not difficult to check these troublesome visitors; this may be done, by searching for them on their first appearance and destroying them; early in the morning grubs may be collected from the earth, within two or three inches of such plants as they have attacked the night previous. The approach of caterpillars is discoverable on the leaves of Cabbages, many of which are reduced to a thin white skin, by the minute insects which emerge from the eggs placed on them; these leaves being gathered and thrown into the fire, a whole host of enemies may be destroyed at once; whereas, if they are suffered to remain, they will increase so rapidly, that in a few days the plantation, however extensive, may become infested; now, when once these arrive at the butterfly or moth state of existence, they become capable of perpetuating their destructive race to an almost unlimited extent. These remarks apply to all other insects in a torpid state. Worms, maggots, snails or slugs, may be driven away by sowing salt or lime in the spring, in the proportion of from two to three bushels per acre, or by watering the soil occasionally with salt and water, to the quantity of about two pounds of salt to four gallons of water; or the slug kind may be easily entrapped on small beds of plants, by strewing slices of turnip on them late in the evening; the slugs or snails will readily crowd to them, and may be gathered up early in the morning (before sunrise) and destroyed.

"If it be necessary at any time to sow seeds in dry weather, it is recommended to soak the seeds in water mixed with sulphur. This practice, with attentive watering, will cause the seed to vegetate speedily.

"Many kinds of seeds, such as Asparagus, Capsicums, Celery, Fetticus, Leeks, Lettuce, Onions, Parsnips, Parsley, Rhubarb, Salsify, Spinage, and other light seeds, will not vegetate freely unless the ground be watered, or rolled; where there is no roller on the premises, the following may answer for small beds as a substitute: after the seed is sown and the ground well raked, take a board (or boards) the whole length of the bed, lay them flat on the ground, beginning at one edge of the bed, walk the whole length of the board, this will press the soil on the seeds, then shift the boards till you have thus gone over the whole bed. In the absence of boards, tread in the seed with your feet, or strike on the bed with the back of your spade, or shovel.

"If it should be requisite to transplant any thing when the ground is dry, the transplanting should be always done as soon as the earth is fresh turned over, and the roots of the plants should be steeped in mud made of rich composts, before they are set out.

"I have in most cases recommended seeds to be sown in drills drawn from 8 to 12 inches apart, in preference to sowing broadcast, because the weeds can be more easily destroyed by means of a small hoe; and which, properly used, greatly promotes the growth of young plants.

"The following table may be useful to the gardener in showing the number of plants, or trees, that may be raised on an acre of ground, when planted at any of the undermentioned distances.

Distance apart.	No. of plants.	Distance apart.	No. of plants.
1 foot	43,560	9 feet,	537
1½ feet,	19,360	12 feet,	302
2 feet,	10,890	15 feet,	193
2½ feet,	6,969	18 feet,	134
3 feet,	4,840	21 feet,	98
4 feet,	2,722	24 feet,	75
5 feet,	1,742	27 feet,	59
6 feet,	1,210	30 feet,	48."

Suggestions relative to Florists' Work for May.

By the EDITOR.

If in the field I meet a smiling flower,
Methinks it whispers, "God created me,
And I to him devote my little hour,
In lonely sweetness and humility."

This is considered the loveliest month in the year. Unanimated nature is not only clothed, but is in her gayest attire; every color and form are displayed with the utmost taste to please and delight the eye. Animated nature is not only cheered but vocal with song. Who can refuse to join in the universal chorus? Whose mind is so constituted that it cannot be enlivened when the eye, the ear, and the smell are so richly regaled? Deep must be the trouble and corroding the cares of him whose vibratory chords are not struck into tune.

HOT-HOUSE.

AIR.—Plants in the hot-house require to be accustomed to air by leaving the sashes down in the day time, and sufficiently so in the mild nights, to prevent the air from becoming close and heated. They require to be well watered every day, and syringed as often as every other day.

RE-POTTING.—Messrs. Hibbert and Buist consider the present and the succeeding month, in preference to August, to be the most suitable time to re-pot hot-house plants. They give the following reasons. Fresh soil in August stimulates to a renewed action that the warmth of the weather will not sustain, and consequently assumes a yellow cast. Whereas, re-potted in the spring the increased vigor is sustained, and the wood is properly ripened.

GREEN-HOUSE.

OPEN EXPOSURE.—About the first of the month the more hardy plants should be taken out of the green-house. These plants, geraniums for instance, that are inclined to grow spindling, should be so placed that they may have as much light as possible. The plants generally should not be exposed to the sun all day, particularly if the pots are so situated as to become heated. Great care is requisite in watering, some requiring much more than others. Knowing their native country and their habitat is a great guide. Succulent plants require much sun, while others generally require but a little.

FLOWER GARDEN.

SOWING SEEDS.—Hardy annuals and biennials should be sown early in the month. Those exotics of warmer climates require to be sown about the middle of the month. Various kinds of perennial seeds should be put in the ground.

SHADE.—Tulips, hyacinths, anemones, and ranunculæ, require to be lightly shaded while in flower.

DAHLIAS, Tuberoses, and Amaryllis, should be planted early in the month, and carefully labelled.

DOUBLE WALL FLOWERS.—Being partially biennials they are seldom propagated by seeds, but by shoots, which should be about three inches long, and put in a shady situation.

ROOMS.

EXPOSURE.—Plants that have been in open airy rooms can with safety be turned out into the open air the first week in May. The more delicate ones, however, should be retained a week or two longer, according to the state of the weather. Judgment should be consulted, so that the air, the wind, and sun, should not greatly vary, at first, from what they were accustomed to in the rooms.

BULBS.—Those that have done flowering should have the pots laid on their sides to ripen the bulbs. In a week or two the bulbs ought to be taken out, dried, put in papers, and carefully marked.

GENERAL REMARKS.—Much attention should be given to saving seeds of flowers when ripe. A few of the best from the most healthy and vigorous plants are more valuable than many promiscuously gathered. Every florist, and every lady who cultivates, should keep a diary of her floral operations,—the time of flowering under ordinary or peculiar treatment, when turned out into the open air, the effects of the air of the room, mode of propagating, and various other particulars. Such a diary would serve as a directory for future years, and would not fail of increasing the knowledge of plants.

ENGRAFTING.—Sir: I now take the opportunity of communicating to you a new way of *engrafting* fruit trees practised by a medical friend of mine, Dr. P. He told me he cut a small peach tree off near the root, and made a small split in the stump, and having inserted the twig or cutting in the common way, he took some *adhesive plaster*, and having spread it over a bit of cloth, heated it over a few coals and applied it to the place where he put in the twig: the tree done remarkably well, and now bears fruit.

Yours, &c. OLIVER.

Lexington, Va. April 10, 1833.

REMARKS.—We are obliged to our correspondent for the above, and hope to hear from him often.

Podophyllum Peltatum (May Apple.) By Q. Z. [For the New-York Farmer.]

Polyandria Monogynia, of Linnæus.
Ranunculaceæ, of Jussieu.
Calyx, three-leaved; corolla, about nine-petalled; stigma large, crenate, sessile; berry, one-celled, crowned with the stigma, large, many seeded; columella, one-sided.—*Eaton.*
Stem, one-flowered; leaves, peltate, palmate, lobate; lobes, cuneate, incised.—*Barton's Com. Flo. Phil.*

Podophyllum is derived from two Greek words ποδος, a foot, and φυλλον, a leaf, in allusion to the resemblance of the leaf to the web-foot of aquatic birds. This species, the May apple, is a common plant in many sections of our country, from the Canadas to Florida. It is found on the borders of rich shady woods, and by the sides of rivulets of water. The root is creeping, and grows from three to six feet in length. The whole plant is about a foot high. It consists of two leaves on a single stem, which, in the junction formed by the footstalks of the leaves, supports a flower, and afterwards a fruit. The flower is white, the stamens yellow, from thirteen to twenty in number. The fruit (*a*) is lemon-colored, is about the size of a common garden plum, possessing when ripe an acidity and flavor by most persons highly esteemed. It is "exclusively a native of North America," blooming in the Middle States in May, and ripening its fruit in September.

Medicinal Properties.—The root of this plant is highly valued for its medicinal properties. "There is no indigenous plant whose virtues are better ascertained at present. Its proper place in the materia medica is among *cathartics*, and it may be ranked among the most safe and active of this class of medicines;"* the dose is a tea-spoon-full of the pulverized root, taken in sugar water or any other convenient form. Q. Z.

Newburgh, March, 1833.

* Barton's Medical Botany, vol. 2, p. 14.

English Gooseberries—Ripening Grapes. By M. Saul. To the Editor of the New-York Farmer and American Gardener's Magazine.

Sir,—I have sent you the price list of the gooseberry trees, and I have marked the weights with the pen, (that is, dwts. and grs.) I took the weights from the gooseberry record of 1832, so that your readers may have the names, prices, and weights, of each sort. The following are the heaviest in each class:

Red Young Wonderful, 27 dwts. 13 grs.; Green Bumper, 30 dwts. 18 grs., this is a seedling, first year of fruiting; White Ostrich, 24 dwts. 20 grs.

There are 22 new seedlings this year, 1832: 6 Red ones, 4 Yellow, 8 White, 4 Green.

The monstrous Pear, called the Green Mountain, has weighed this year, 1832, 20½ oz. I sent a tree of this valuable pear to Mr. Prince, of the Linnæan Botanic Garden, near New-York, about 3 years ago. This pear was raised a few years ago in this neighborhood, and is therefore little known, being raised by a cottage gardener, in a village 6 miles from Lancaster.

A singular Twin Cucumber was produced this season; it was perfectly double, being nearly joined together from end to end by the rind; it measured 13 inches long, 6½ inches broad, 17¼ inches in circumference, and weighed 5¾ lbs.

With respect to Harrison's mode of Glazing, noticed in the London Horticultural Register on this subject, I refer you to No. 4 of the Horticultural Register, pages 147 and '8; you will there find my opinion on Mr. Harrison's plan of glazing.

The following is Mr. Money's plan of constructing Hot-Houses: A lofty house shows grapes the best, say 7 feet high in front and 14 feet high at back; but a high house is hardest to keep warm. If I intend for grapes, and a sloping bank, a good foundation is a great desideratum, and when practicable I raise the ground in front of the house 4 or 5 feet in a sloping direction for about 30 or 35 feet. I would have loam from a pasture ground, a fourth part of rotten horse dung, and a fourth part of sharp sand from a river or brook. This well incorporated will do. Plant the vines on the outside, but do not suffer their stems to appear, or frost will injure them.

When grapes are wanting to be kept late, a dry house is best. I leave the latest sorts until February, and the cutting until April, when black grapes and brown leaves have a singular appearance; but the grapes are as good as they are in October, through keeping them dry. The glazing should be done with putty that will not crack. The outside putty should have 1 lb. of white lead to 10 lbs. of putty previous to using, and that will prevent it from cracking. The putty for the laps should be made with sweet or train oil, for linseed dries and shrinks, and soon slips the laps are better puttied, as it strengthens the glass and causes it to repel a hailstorm.

The flues should be 12 inches deep, 7 inches wide inside, and set clear of the ground by two bricks, flat, to receive the joints of the flags or tiles of the bottom of the flues; the bricks are laid flat, not edge-ways, for such a thickness of the flue retains the heat much longer; and I would here remark that my plan of the hot water system, placed also on the flue, is a great advantage, for at some seasons the flue will not draw so well; but by the tubes being in the fire, the heat is sure to be got up by hot water, and when the flues are in a great drawing way, there is a saving in the fire, as one half is only required. This plan I published in No. 458 of the Mechanics' Magazine, which I sent you.

By this plan a great advantage is obtained by being sure of keeping the house dry in the autumn, or the grapes will mould and drop off; and never suppose that grapes are forwarded by keeping a close house; but it is the means of spoiling them, for the damp will seize the foot stalk of the berry, and they will shrivel or turn red and be sour. Plenty of free air is highly necessary, to carry off the damp. The slides should be in the roof, every two or three feet from each other, to give fresh air.

By having a proper selection and different houses, growers may have grapes for 9 or 10 months in succession, commencing forcing about the 20th of January.

The following sorts are well deserving of cultivation, namely, the Muscat Escholate, a new variety, raised from seed by Mr. Money, of the Haverstock Nursery, London; the Muscat Tottenham Park, White Frontignac, West St. Peter, Black Hambro, the White Hambro, this is about a month later than the Black Prince, New Dutch Sweet Water, very fine White Muscadine.

For late forcing the Black Escholate, a new seedling, raised by Mr. Money; the Poonah, the Oldakers, St. Peters. To commence forcing about the middle of April, so that the fruit begins to change color in August, and becomes black in the middle or in the end of November, and may be kept till April. For winter forcing, see Loudon's Gardeners' Magazine, vol. 1, p. 36. I remain, yours, M. Saul.

Indian Corn on New Lands—Method of Cultivation in Illinois. By a Farmer at Sandy Bluff. To the Editor of the American Ploughboy.

Sir,—The opinion of the Editor of the American Farmer, as published in the first number of the American Ploughboy, upon the inquiry of the farmers on the banks of the Ohio, I conceive to be somewhat incorrect, or at least not as explicit as it would have been, had the Editor been better acquainted with the usual method of growing corn in the *far west*. It is a fact known to the farmers of the west, that corn does not ripen as fast on a new loamy soil, as on a sandy soil, or any soil that has been cultivated a sufficient length of time to have completed the vegetable decomposition that is attendant on all grounds under the first stages of cultivation. Where the vegetable decomposition is most abundant, corn and other plants grow with astonishing rapidity, while they are nourished by an "over abundance of crude vegetable matter," till the time of "shuteing" for the ear; at this period the rapid growth of the plant is considerably lessened, and it begins to absorb from the earth a sacharine matter; and in proportion to the sweetness of the plant, the fruit grows and ripens, until its sweetness is seemingly deposited in a latent state in its fruit, to remain to be disengaged only by the artist, or the process of vegetable decomposition. While the succulent plant is supported by an abundant supply of moisture and crude nutriment, or while it grows with such astonishing rapidity as above mentioned, it is well known to the observing farmer that it does not absorb or form that sacharine matter so indispensably necessary for the maturity of its fruit, but in a small proportion. Hence I conceive the want of this principle to be the true cause why corn does not ripen as fast nor as perfect on new grounds, as on old cultivated fields; for while the vegetable decomposition is going on, and the soil in a state of fermentaton, the sacharine matter is not, neither can it be, abundant, as, in the process of fermentation, it must escape in great abundance, or is held in chemical suspension in such a degree as to prevent the plant from receiving an abundance of its most essential nutritive principles.

For the information of our friends in the

east, I will simply state that corn does not ripen in this country on any of the new grounds as fast as on the old cultivated grounds. The prairies are more forward than the timbered districts, but in either the early maturity of the crop depends upon the scanty decomposition of vegetable matter that is going on in the earth. Generally speaking, the first crop is not much depended upon, and is termed the stock corn, and used for forage only; the second crop is better, and the third better still. The first crop is materially benefitted by raking the ground and completely clearing it of all leaves, sticks, grass and weeds, before it is broken up, and after by keeping the ground free from weeds, &c.

A FARMER AT SANDY BLUFF.

Sandy Bluff, Morgan Co. Illinois, March 2, 1833.

NEW-YORK FARMER.

MAY 1, 1833.

BONE MANURE.—We acknowledge the reception of a barrel of Bone Manure from Mr. DAVID S. OGDEN, who has an establishment in full operation to meet any demands. His factory is at Coles' Mills, or Red Hook, two miles from the Brooklyn Ferry, on Long Island. Orders left with Mr. Langdon, at the Ferry, will receive attention. The prices are according to the fineness to which the bones are ground—30, 35, and 40 cents per bushel. The number of bushels required to an acre is of the coarsest 35, of the medium 30, and of the finest 20. Some of the enterprising farmers in this vicinity are giving pretty large orders for this cheap, very fertilizing, and long effective manure. We hope others will step forward and give Mr. Ogden encouragement.

LUCERNE.—This grass has long had a high reputation in Europe, and many of our best and most distinguished farmers in this country consider it well adapted to the wants of the farming community. Mr. J. C. Church, 37 Madison street, New-York, has found encouragement to increase his annual importations of this seed.

GRAFTING.—Farmers should remember that this is the season to graft. A few hours devoted to grafting with choicest kinds of fruit will add much to their comfort in a few years, and very probably increase the saleableness of their farms. Saw the limb off, drive in a wedge, leaving space on each side of it equal to the size of the two grafts to be inserted, and cut the grafts in the shape of a long wedge. After they are snugly inserted, apply clay, or a mixture of lard, bees' wax, or almost any other substance that will keep out the rain, and the grafts from becoming dry.

THE SEASON.—In this vicinity, and, as far as we have been able to learn, in other sections of the country, the season is from ten to fifteen days earlier than the last. The weather has not been only mild, but is now become dry. Farmers and gardeners have had a fine season to get their work advanced.

It is, we believe, a general remark, that a forward April is not followed with a fruitful season.

TRANSPLANTING.—Most kinds of plants may be taken up at almost any period of the year, provided it be done with great care—leaving as few of the roots untouched as possible, and when setting them out, wet from the rose of the watering pot all the dirt with which you fill, except that put on the top. If water is poured on the surface, it forms a crust impervious to the air, which is very requisite to insure success. At this growing season, as well as in the fall and winter, shrubbery and small trees may be removed by detaching with the spade the plant with a ball of earth of about two feet diameter, and leaving it for a week or more to throw out new fibrous roots before it is hoisted out or removed.

THORBURN'S SEED STORE.—Every time we visit this establishment, our pleasure is not only renewed, but increased. At this time the plants are in a most admirable condition, making a most tasteful and beautiful display of nature's beauties. The Messrs. Thorburn are deserving of much credit for thus adding to the charms of nature.

STIRRING THE SOIL IN A DROUGHT.—It is an established opinion, that the more the soil is hoed, harrowed, and ploughed, in dry weather, the better are plants enabled to withstand the want of rain. The recorded effects of frequently stirring the soil are surprising. Excellent crops have thus been obtained, when prospects were most forbidding. It is asserted that when dry weather occurs in the spring, before the roots have extended far, there is still a greater necessity of more frequent hoeing and ploughing. The reasons assigned are, that more of the moisture in the atmosphere is condensed particularly in the night, and that more air, which is a poor conductor of heat, becomes imprisoned in the soil, and thus prevents the heat from penetrating.

RELIEF TO CHOKED CATTLE.—A tarred rope covered with silk, or well greased, is recommended to push down substances choking cows. The New-England Farmer gives an instance of laying a cow down with her neck on a block, and breaking an apple in her throat with a blow of a mallet, and thus giving her immediate relief.

BARBERRY BUSHES.—These bushes are supposed by the generality of farmers to be injurious to wheat. Many circumstances are related in various parts of our country, shewing that the impression of their blighting influence is very general. The following is extracted from vol. V. page 176, of the Massachusetts Agricultural Repository:

"The opinion that barberry bushes injure grain crops by causing blight, often deemed a prejudice, and by many considered as an unquestionable fact, has lately received the most full and scientific investigation in France. The result of these inquiries, comprised in no less than 84 pages of Tessier's Annals of Agriculture, seems to settle the question as to the injurious effect of this plant, and that it is pretty uniformly, in France, England, Switzerland and Germany, considered, and we may say almost proved to be, one of the causes of blight. We ourselves were perfectly incredulous to this subject, but were compelled to yield to the weight of proofs.

"It is no longer attributed to the influence or operation of the farina of the flower of the barberry, which is over and disseminated several weeks before the several species of grain are in blossom, but it seems to be attributed to a parasitic plant very abundant on the barberry, and which is considered to be the same which causes the rust upon the stalk of the wheat. It would be beyond the scope of this journal to give all the evidence on this subject, but we can refer our readers to the work above mentioned. We can assure them that, though wholly incredulous, we have been perfectly satisfied with the evidence, patiently, coolly, and fairly sought and furnished in that work.

"France being of all nations, perhaps, the most interested in this inquiry, much respect is due to the deliberate opinions thus formed after candid research."

EATING VEGETABLES.—We find by inquiries in the markets, that the impression that eating vegetables predisposes to the cholera again begins to operate injuriously to gardeners. We would recommend those who sell vegetables to appoint a committee, to obtain the opinion of our most experienced physicians on this subject. The Gardeners' Society of London addressed circulars to the physicians of that city, who gave opinions that vegetables were not only not predisposing to the cholera, but decidedly wholesome and safe, and rather preventives. It would be well for the interest of gardeners that the New-York Horticultural Society should take this subject in hand. During the cholera visitation of last summer, we remained in the city, and moderately eat of green corn, cucumbers, and other vegetables, as usual.

RHODE ISLAND CLASSICAL AGRICULTURAL SCHOOL.—The Rhode Island Society for the Encouragement of Domestic Industry has passed resolutions, and taken steps to establish a Literary Institution on the Manual Labor system. The object is to afford the students an opportunity to obtain "a good liberal education, and to become scientific and practical farmers and mechanics." We are happy to record all such laudable undertakings, and hope every citizen of the state of New-York will feel it incumbent on him to do what is in his power to establish one similar State Institution.

MARYLAND HORTICULTURAL SOCIETY.—From the American Farmer we learn that this society is in successful operation. Judging from the plants exhibited, we are led to conclude that there are some connoisseurs as well as amateurs and practical florists in Baltimore. We make the following extract from their proceedings in April:

"Zebulon Waters, Esq. presented a most charming production discovered by him last spring in a wild state in the neighborhood of this city—the double flowered Wood Anemone, (Anemone Thalictroides.) The single variety is quite plentiful in our woods, but the double one is very rare. It is well worthy of cultivation, and the delicate beauty of its rose tinted blossoms will amply repay whatever trouble may be taken with it.

"Two roses exhibited by Mr. Samuel Feast excited general interest. They are quite new varieties, raised by him from seeds. One was obtained from the seed of the common tea rose, very probably with an admixture of some other variety. The appearance of the plant and its foliage is particularly neat; it grows very freely, and flowers beautifully. Blossoms large and well colored, borne on graceful stems, with a singular fragrance, like that of the common tea rose and the China rose combined. It has been named, in compliment to an amateur of the city, Kurtz's rose, or *Rosa Thea, var. Kurtzii.*"

GARDENERS SERVING A LONG TIME.—There is perhaps no one subject to which Horticultural Associations could give their attention with more benefit to the community than encouragement and premiums to gardeners remaining a long time with their employers. Independent of the increased attention which would be given to gardening, a happy effect would be produced on the habits, disposition and character of gardeners. They would become more uniformly industrious, would form those attachments to families and neighborhoods that rivet the affections, and would stimulate to establish a reputation of moral character, the importance and necessity of which is not seen and felt in so great a degree by those who lead a migratory life. Premiums should be given not only to gardeners, but to the employers, for not uncommonly is a gardener, who has done his utmost to please his employer, set adrift on the wide world for some trifling cause. He is thus discouraged, his mind soured, and his feelings misanthropic. There is something very soothing in the idea of remaining for years or for life in a family, to a gardener who has been long tossed on the seas and driven by the winds of this troublesome world. Let then gardeners and employers, when they seek reciprocal aid, indulge a supposition that the bargain is for life, and not for a year or a month. This very supposition or life-conditional bargain will be beneficial to both parties.

TEMPERANCE.—It is with pleasure that we see the temperance cause prospering—not only in this country, but throughout the world. A united effort of numbers and of talent is every day increasing in effect, and producing the most happy changes. The most able and distinguished men of our own and of other countries consider it to their honor to give their names and example, and to exert their talents, in emancipating their fellow creatures from the worst and most cruel slavery. We hope every farmer will duly consider his obligations to society, and throw the weight of his active influence in lessening the amount of human woe.

SINGULAR GOOSE.—One of our neighbors has a goose that manifests an unusual attachment to its owner. Without having received any tutoring, it exhibits all the fondness for its master that is characteristic of the most faithful dog—is anxious to follow him at all times—is watchful of every movement—takes its position between his legs when setting down—looks up into his face and makes a low quack—goes to his bed-side in the morning, or when he is sick—when unable to keep up with him, when following him, takes to the wing—and upon hearing his voice, flies over the fences or other intervening object to get into his presence.

SLAVE LABOR.—We have always been of the opinion that the substitution of free or even white persons for slaves in the southern states would be attended with numerous happy effects. We are glad to copy the following worthy example:

"We learn from a correspondent, that Mr. Wirt, the late Attorney General of the United States has purchased a large tract of land in Florida, for the purpose of cultivating the sugar cane. Instead of employing slaves, as is usual for such labor, he has made an arrangement with several hundred German emigrants, who go on to Mr. Wirt's estate under the charge of Lieutenant Goldsborough. This may be considered a good beginning, and may in time be the means of substituting free white labor where slaves only have hitherto been employed. We are desirous to see an end put to slavery in this *free* country, but not sooner than shall be compatible with the rights and privileges granted by our laws to the owners of such property."

KNITTING MACHINE.—Mr. John McMullan, of Birmingham, Pa. has invented a machine that occupies the space of about one cubic foot, for knitting woollen stockings. It is also adapted to cotton, silk, or linen. It costs fifteen dollars.

TROPICAL PLANTS.—Dr. Perrine writes from Campeachy under date of March 13, 1833, requesting the proprietors of green-houses in the United States to furnish us a list of all the green-house plants that may be profitably cultivated in the climate of Cape Florida, and the terms on which they will dispose of one or two of each. A compliance with this request is respectfully solicited.

Dr. P. states that he has forwarded to Boston two varieties of the hemp plant, and several of the same to New-Orleans.

The undertaking of Dr. Perrine to introduce tropical plants in the United States every day in our view increases in importance. In addition to former information on this subject, we subjoin the following relative to plants of British India:

In a plant of the leguminose family, and one of the extensive genus *Crotallaria*, we have a very general substitute for hemp throughout the warmer parts of India, and even of Asia. This is the *Crotallaria juncea*, or *Sunn*, as it is commonly called by the natives. Threads called *pavitraca*, from their supposed purity, have been made from it from time immemorial, and are maintained in the laws of Menu. Many experiments were made upon the fibres of this and other Indian plants used as substitutes for hemp by the late Dr. Roxburgh; and it was his opinion that *sunn*, when properly prepared, was very nearly as strong as hemp, and for various reasons preferable to it in India. The plant grows to about eight or ten feet high. An acre yields, of the half-cleaned substance, (the state in which the natives carry it to market,) about 600 pounds' weight, and sells for about a rupee and a quarter per *maud* of 80 pounds. This is the only plant cultivated by the natives of the Coromandel coast as food for their milch-cows during the dry season. Roxburgh also says that he found it by experience to be very nourishing, and to produce more milk than most other fodder. It perishes after bearing two or three cuttings.

Various species of *Cluytia* are esteemed for their hard and durable wood of a red or pink color. *Rottlera tinctoria* of Roxburgh yields a valuable die. It is a middle-sized tree, growing in the mountainous parts of the Circars, having an erect trunk, and producing racemes of capsules about the size of a cherry, each of which is covered with a quantity of red powder. This powder is carefully brushed off the ripe capsules, and constitutes a considerable branch of commerce from those parts of the Circars, being purchased by the merchants trading to Hydrabad and other interior parts of the peninsula. It is said to dye silk of a very beautiful, bright, and durable orange or flame color. The botanical reader will be aware that the genus *Rottlera* of Roxburg is not the *Rottlera* of Vahl. The former is supposed by some botanists not to be distinct from *Trewia* of Linnæus.

Swietenia febrifuga and *chloroxylon* furnish excellent timber. The former is the redwood-tree of Coromandel, a very large tree with a lofty, thick, and straight trunk. The wood is of a dull red color, remarkably hard and heavy, and used by the natives as the most durable kind they know for all the wood-work in their temples. *S. chloroxylon* is a native of the mountainous parts of the Circars, and is reported by Roxburgh to be of a deep yellow color, exceedingly close grained, heavy, and durable, and to come nearer to boxwood than any other wood he had met with.

PATRONAGE OF AGRICULTURAL PAPERS.—We have had our feelings wounded—our feelings of honor for this nation of farmers—when hearing the proprietor of the New-York Farmer, who publishes several political newspapers, one for internal improvements, and another for mechanics, say that every day he is compelled, against his prepossessions, to draw unfavorable contrasts respecting the liberality of farmers. A poor journeyman mechanic, who by hard labor supports himself and family, will, with far greater readiness, part with three dollars for a periodical devoted to mechanical pursuits, than a farmer, who owns a valuable farm, for one devoted to agricultural affairs. Why is it so? Why have such great improvements and discoveries been made and adopted in manufacturing and mechanical pursuits, and so few in agriculture? Why has steam been applied to augment every resource but that of agriculture? Simply because farmers are less disposed than any other class of the community to read, study, and patronize works relating to rural affairs.

Although several hundred subscribers have added their names to the New-York Farmer within the last few months, yet the increase is but meagre compared with what it ought to be. Some of our subscribers have added from five to a dozen new and valuable subscribers since the commencement of the new series. Why will not all go and do likewise? We generally find that those who write much for our paper, do the most to increase the patronage. They are doubly our friends. The following is from the American Farmer, which has done enough for its country to entitle its proprietor and editor to a liberal pension from government:

"We select for publication another letter, from among many, on the subject of the patronage of the American Farmer. We know not how it is, but so it is, that the first and greatest subject of human interest receives the least attention. What nation is there on the face of the earth, either great or prosperous, in which agriculture is neglected? And we may reverse the proposition: What nation is there, with improved agriculture, that is not prosperous and powerful, and whose people are not happy and comfortable? As it respects the dissemination of knowledge, through the medium of the press and otherwise, it would seem that the subject of most importance to the whole community would naturally be the first to receive attention, and the one that would demand the greatest portion of it too; and, therefore, that the present position of politics and agriculture would be reversed in this respect. But so it is. There are some twelve or fifteen hundred political papers in the United States, and only eight or ten devoted to agriculture; and the patronage of all these, too, if concentrated upon one, would not be greater than many a single political paper receives, and would then be no very great object. We like the spirit of the following letter on this subject.

"BLACK WALNUT, Va., March 23, 1833.

"DEAR SIR,—Inclosed you will find ten dollars, my subscription for the American Farmer, for the 14th and 15th volumes. By way of

atonement for delay in paying for the year just ended, I now pay for that and the one just commencing. I wish you success in the publication of a work which deserves the patronage of the agriculturists of the United States, and to which I would gladly lend any aid in my power. I can but observe, that it is no less a mark of bad taste than bad economy, to contribute to the circulation of political papers, of all grades, sizes and qualities, which serve but to inflame the passions, delude the understanding, and corrupt the morals of the community. For, as political papers are conducted at present, without regard to principle, or respect for private or public worth, abusing without discrimination, or lauding beyond measure, whoever approves or disapproves whom they applaud or condemn, contending for consistency and principles, without the possession of either; while a paper, admitted by all conversant with its merits to be really valuable, and eminently so, should decline in patronage, meet with a precarious support from the American people, especially the agricultural part of them. This should not be so; are agriculturists wise enough, are they alive to the true interest and glory of their country? The worn, gullied, and piny barrens of Virginia at least say no. While her politicians boast of her proud and lofty standing, why are her best citizens selling their worn and worthless lands, and flocking to the West and South? Sir, the reason is obvious; the neglect of all inquiry on the subject of vital importance, while they are all distraction and confusion on some eternal political bubble; which, though it last but for a week, will but make room for a successor. Thus in watching the folly of others, we give uncontrovertible evidence of our own. If one-tenth of the time and money that has been expended in Virginia in the discussion of abstract principles, and boasting of Virginia influence, Virginia doctrines, and Virginia patriotism, had been expended for the last twenty years in the pursuit of agricultural and mechanical information and improvements, I think I may venture to say Virginia would not have retrograded in her influence and numerical importance in the Union. Please excuse this digression, and accept assurances of my best wishes."

The following article contains so much practical information, and so methodically presented, that we can not delay in giving it to our readers. It forms a part of the proceedings of the New-York State Agricultural Society.—[ED.]

Letter from Dr. Wm. Darlington, of Pennsylvania, on the Use of Lime in Agriculture.

WESTCHESTER, (Penn.) December 17, 1832.

Dear Sir,—Your letter, containing a number of queries relative to the operation and utility of *Lime*, in the processes of agriculture, was received in the early part of June last: but as I have been much engaged during the past summer, with duties which required all my attention, and as your letter intimated that answers furnished "any time during the present year" would be in season for your purposes, I have taken the liberty to postpone my reply until now.

I proceed, then, with great pleasure, to furnish you with such facts and remarks as my opportunities for observation have enabled me to offer. With a view to render the answers more explicit and satisfactory, I will annex them, *seriatim*, to your several inquiries.

Query I.—"Upon what lands does lime operate most beneficially:

1. In regard to geological formation,—as primitive, transitory, secondary, and alluvial?

2. In reference to the soil,—as sand, clay, lime, and vegetable matter?

3. As indicated by natural growth of timber and plants?"

Answer.—My residence has always been in a *primitive* region, and my observations very much limited to agricultural processes in soils upon that formation. The prevailing rock here is gneiss,—with occasional beds, or veins, of hornblende, green stone and sceinite.—About five miles to the north of us is the great valley of transition limestone, stretching from northeast to southwest; and immediately on the southern side of this valley, running parallel with it, is a broken ridge of hills, formed of mica slate, with beds of serpentine rock and hornblende on the side next to the gneiss rock, on the southeast. Over the gneiss rock, and among the hornblende, the soil is generally a stiff loam; and there, I think, the best effects are perceptible from a given quantity of lime. On the soil overlaying the schistose rocks, the good effects of lime are sufficiently obvious, under the management of skilful farmers; but the benefits seem to be less permanent. On the serpentine rock the soil is extremely sterile, and neither lime nor barn-yard manure can be used with much advantage. In the limestone soil of the great valley, where one would suppose it was already redundant, lime is used with advantage; and much heavier dressings are put on, than in the adjacent districts. I cannot furnish the *rationale* of this practice; but I believe the fact is established, that more lime is required to produce the same beneficial effect upon soils resting on limestone rock, than upon those overlaying gneiss, and perhaps some other primitive rocks.

I have had no opportunity to witness the effect of lime upon *secondary* and strictly *alluvial* formations; but the above circumstance has led me to suspect, that the *same quantity* of lime would not be so signally beneficial in secondary, as it is in certain primitive formations.

Lime, undoubtedly, has a good effect in soils which are *sandy*, even where sand predominates; but I believe its meliorating properties are most conspicuous in a *clay* soil, or rather in a *stiff loam*. A good proportion of decomposed vegetable matter adds greatly to the beneficial effects of lime; and hence our farmers are desirous to mingle as much barn-yard manure as possible with their lime dressings, and to get their fields into what is called a good sod, or turf, full of grass roots. *Then* a dressing of lime has an admirable effect.* The soils indicated by a natural growth of black oak, (*quercus tinctoria*,) walnut (*juglans nigra*,) and poplar (*liriodendron*), and those in which such grasses as the *poas* and *festucas* best flourish, are generally most signally benefitted by the use of lime. In short, I may observe, that lime has been found more or less beneficial in any description of soil, in this district. It is most so on hilly or rolling lands, where clay predominates,—less permanently so among the mica slate,—and least of all, on the magnesian rocks. The soil on these last is rarely worth cultivating.

Query II.—"What quantity of lime is applied to the acre, upon different soils, at a single dressing, and during a period of years?"

Answer.—The quantity of lime per acre, which can be used advantageously, varies with the condition and original character of the soil. Highly improved land will bear a heavier dressing than poor land. On a soil of medium condition, the usual dressing is 40 to 50 bushels per acre. A deep rich soil, or limestone land in the great valley, will receive 70 to 80 (and I am told even a hundred) bushels to the acre with advantage. On very poor land, twenty to thirty bushels per acre is deemed most advantageous to commence with. It is usually repeated every five or six years—i. e. every time the field comes in turn to be broken up with the plough; and as the land improves, the quantity of lime is increased. The prevailing practice here is to plough down the sod, or *lay*, in the fall, or early in the spring,—harrow it once, and then spread the lime (previously slacked to a powder) preparatory to planting the field with Indian corn. Every field, in rotation, receives this kind of dressing; and as our farms are mostly divided into about half a dozen fields, the dressing of course comes once in six years, more or less according to the number of the fields. Some enterprising farmers, however, give their fields an *intermediate* dressing, *on the sod*, after they come into grass; which I consider an excellent practice, tending rapidly to improve the condition of the land.

Query III.—"Is it applied in a caustic or an effete state?"

Answer.—It is usually obtained in a caustic state from the kiln,—deposited in heaps in the field where it is to be spread, and water sufficient to slack it to a powder is then thrown upon it. As soon as slacked it is loaded into carts, and men with shovels distribute it as equally as possible over the ground. It is generally considered best to put it on the ground whilst it is fresh, or *warm*, as the phrase is; and it is certainly easier to spread it equally while in a light pulverised state, than after it gets much wet with rains. I am inclined to think, too, it is better for the land, when applied fresh from the kiln.

Query IV.—"To what crops is it most advantageously applied, and at what season?"

Answer.—It is usually applied, as already intimated, to the crop of Indian corn, in the spring of the year—say the month of April. Occasionally it is applied, preparatory to sowing wheat in autumn. When used as a *top dressing*, on the sod, it is generally applied in the fall—say November. The prevailing impression is that it is most advantageously applied to the Indian corn crop; and hence the general practice. But the truth is, it is highly advantageous at any and at all seasons; and our shrewd old farmers have a saying,—"*Get your lime on for your corn, if you can,—but be sure you get it on the land some time in the year.*"

Query V.—"How is it incorporated with the soil—by the plough or the harrow? and is it applied in any case as a top dressing to grass and to grains, and with what effect?"

Answer.—As already stated, after the sod is ploughed down for Indian corn, it is usually harrowed once to render the surface more uniform. The lime is spread as equally as possible over the field, and then the ground is well harrowed in different directions, in order to incorporate the lime with the soil. Soon afterwards, the field is marked out and planted

* The yard manure is not usually mingled with the lime when the latter is first applied. The practice is, to lime the *Indian corn* ground, prior to planting that grain, on the inverted sod,—and, the ensuing spring, to manure the same field for a *barley* crop; or, to reserve the manure until the succeeding autumn, and apply it to the *wheat* crop. It is not well settled which of these is the better practice. Each has its advocates; but it is most usual to reserve the manure for the wheat.

with corn. The plough is rarely, if ever used, for the purpose alluded to. I have mentioned above, that lime is occasionally used as a top dressing for grass. It appears to be particularly beneficial to that crop; and answers extremely well when applied in that manner. The practice of applying it to Indian corn, as above related, is, however, chiefly followed: and the application of a dressing to each field in rotation, causes as much labor and expense every year as our farmers generally are willing to incur. Lime has rarely been used as a top dressing to grain crops, within my knowledge.

Query VI.—"What is the ordinary cost per acre of liming, and the relative profits, in increased products, of a period of years?"

Answer.—Quick lime, at the kilns, usually costs twelve and a half cents per bushel. The farmers generally haul it with their own teams; and the additional expense depends, of course, materially upon the *distance*. It is frequently hauled by them a distance of 8, 10, and even 12 miles. The average, perhaps, is about 5 or 6 miles. It is delivered to me by the lime burners, (a distance of nearly six miles,) at 18 cents per bushel. At the rate of 40 bushels to the acre, the cost at 18 cents, would be $7.20 per acre. It is difficult to estimate with precision the relative profits, in increased products: but I can safely say, from my own experience, on a small farm of middling quality, that two dressings of lime at the above rate, in the course of 8 or 9 years, have more than trebled the products of the land to which it was applied, both in grain and grass. It is to be understood, however, that the system of *ploughing only so much ground as could be well manured* was adopted at the same time. I may also observe generally, that the farmers of this district, (who are shrewd economists,) are so well convinced of the beneficial effects of liming, that, costly as its application seems to be, they are unanimous in sparing no effort to procure it. Lime has been found to be peculiarly favorable to the growth of pasture, when the farm is otherwise well managed; and as our farmers are mostly in the practice of feeding cattle, they resort to liming as an indispensable auxiliary to successful grazing.

Query VII.—"Is lime applied with yard manures, or earthy composts, and with what results?"

Answer.—I have already intimated that vegetable matters, and especially yard manures, are highly important in conjunction with lime. Both are valuable, even when used separately; but when *combined*, the effect is most complete. If to this be added that great secret of good farming, *viz.* to plough only so much ground as can be well manured,—the state of agriculture may be considered nearly perfect.

Lime is, in some instances, added to earthy composts, preparatory to distribution on the field; but it is doubtful whether the extra labor of this method is compensated by any peculiar advantages. It is not generally practised.

Query VIII.—"Is powdered limestone (carbonate of lime) applied to soils; and if so, does it induce fertility otherwise than by mechanically ameliorating their texture?"

Answer.—No instance of powdered limestone being applied to soils has come under my notice. I can, therefore, form but a very imperfect opinion of its utility. If it were even as beneficial as quick lime, (which I doubt,) I apprehend it could not be procured and applied with less cost and labor.

Query IX.—"On what soils, if any, in your neighborhood, is lime found to be inoperative, as a fertilizing application; and the cause of its failure?"

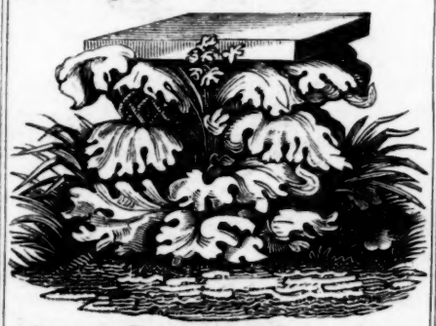
Answer.—There is no soil in this district, deemed worthy of cultivation, on which lime is *wholly* inoperative as a fertilizer. On some sterile slaty ridges, and on magnesian rocks, it has indeed but a slight effect; and even the benefits of barnyard manure are very transient. In low swampy grounds, also, unless they are previously well drained, the labor of applying lime is pretty much thrown away. There seems to be something in the constitution of magnesian rocks peculiarly unfriendly to the growth of the more valuable plants. Indeed, there are patches of the soil perfectly destitute of all vegetation. Repeated attempts have been made to cultivate the bases of our serpentine banks; but neither lime, nor manure, will enable the farmer to obtain more than a light crop of small grain. Neither clover, nor the valuable grasses, can be induced to take root and flourish in the ungenial soil. It is, therefore, almost universally neglected.

I have thus endeavored, (in rather a desultory manner, I confess,) to answer your queries according to my best judgment. If what I have furnished shall in any degree tend to make the subject better understood, I shall be amply gratified. With great respect, I have the honor to be, your obedient servant,

Wm. Darlington.

Jesse Buel, Esq. Cor. Sec. &c.

Rural Architecture.—It is a source of much regret that more attention is not paid to Architecture in country buildings. We often see houses erected that appear naked and uninviting, and which might, with more attention to design, please the eye of every one, and be pronounced beautiful dwellings. If the ancients, as is represented in the following article, borrowed their ideas of their orders from rural productions, why are farmers the last instead of the first to pay attention to architecture?



Supposed Origin of the Corinthian order of Architecture.—The above wood cut represents the leaves of a plant called the Herb Bear's Breech, the leaves of which it will be observed are large and shaggy, and the artist has given it all that beauty of form which it is said, from the accidental circumstance of the pressure on the top, to have originated in the mind of Callimachus the idea of the Corinthian order of architecture.

"It was at first used by the ancients as an ornament to friezes and cornices, and at length to the other members of architecture, but is principally employed as the grand ornament of the *Corinthian and Composite capitals*. The Greeks used for this purpose the leaves of the cultivated acanthus (*acanthus mollis*), commonly called brank ursine, or bear's breech, from its shagginess, which grew spontaneously both in Greece and Italy. The Gothic architects and sculptors, on the contrary, have used the wild and prickly acanthus (*acanthus spinosa*), being smaller in its parts and more suited to the littleness of their styles of art. Although architecture has made the greatest use of the acanthus, yet the other arts have also adopted it as a chaste and splendid decoration. We find among the ancients, as well as among the moderns, various instruments, household furniture, and utensils, ornamented with leaves of the acanthus. These artists, in preserving the general form and character of the plant, have made their sinuosities and curves more or less prominent, to suit their purposes, and have thus given them a more sculpturesque effect. In the Corinthian capital they are executed with more fidelity and elegance: the whole plant surrounds with its aspiring leaves the vase or bell of the capital, as if attempting to lift up the abacus that covers the whole, they then turn down and form themselves into graceful volutes."—[Partington.]

Mental Improvement.—In travelling through different sections of country, or in visiting families even in the same neighborhood, what a striking contrast there is in the relish for enjoyment or pleasures! Some will be almost wholly of a gross physical nature, while others will soon impress you that their most refined and rational enjoyment is of a social and mental kind. The following portrays the difference in simple and clear language:

Knowledge. *By Rev. L. Whitington.*—There is a close connection between ignorance and vice; and in such a country as our own, the connection is fatal to freedom. Knowledge opens sources of pleasure which the ignorant man can never know—the pursuit of it fills every idle hour, opens to the mind a constant source of occupation, wakes up the slumbering powers, and unveils to our astonishment ideal worlds; secures us from temptation and sensuality; and exalts us in the scale of rational beings. When I pass by the grog-shop, and hear the idle dispute and obscene song; when I see the cart rolled along filled with intoxicated youth, singing and shouting as they go; when I discover the boat sailing down the river, where you can hear the influence of rum by the noise which it makes, I cannot but ask—Were these people taught to read? Was there no social library to which they could have access? Did they never know the calm satisfaction of taking an improved volume by a peaceful fire-side? Or did they ever taste the luxury of improving the mind? You hardly ever knew the young man who loved his home and his book, that was vicious. Knowledge is often the poor man's wealth. It is a treasure no thief can steal, no moth nor rust can corrupt. By it you turn his cottage to a palace, and you give a treasure which is always improving—can never be lost. "The poor man," says Robert Hall, "who has gained a taste for good books, will in all likelihood become thoughtful; and when you have given the poor a habit of thinking, you have conferred on them a much greater favor than by the gift of a large sum of money, since you have put into their possession the *principle* of all legitimate prosperity."

Nor is it to the poor alone that this remark applies. The rich need occupation. Their hearts are often like seas, which, stagnate under a breathless atmosphere, putrify for the want of a wave. Employment, roused by some noble object, is the secret of happiness: and of all employment, mental labor lasts the longest. The body soon tires, but the mind, divided in its origin, and immortal in its destiny, pursues its labors with transient pausings; and rises from every check with fresh vigor to continue its eternal flight. What a beautiful picture does Cicero give of the secret happiness his studies opened to him! "You will not blame me, respected judges, at least you will pardon me, if, while some are hurried in business, some keeping holidays, some pursuing pleasure, and some giving their hours to sleep, while one tosses the javelin and another the dice-box, I should steal a little time for the recollection of my studies and the improvement of my mind." Yes, he loved these things better than recreation: to him they were more profitable than business, and sweeter than sleep.

A VAUXHALL SLICE.—At the Vauxhall Gardens in London, a place much frequented by the citizens, the refreshment most approved of consists of a glass of wine, or a cup of coffee, and a *Sandwich*. Every one knows that a Sandwich is a precious morsel, composed of two thin slices of bread and butter, with a *very thin* slice of ham between them. Now the sandwiches of Vauxhall have been for many years famous for their gentility, or, in other words, *want of density*, from which circumstance arose the term now in common use, "a Vauxhall slice."

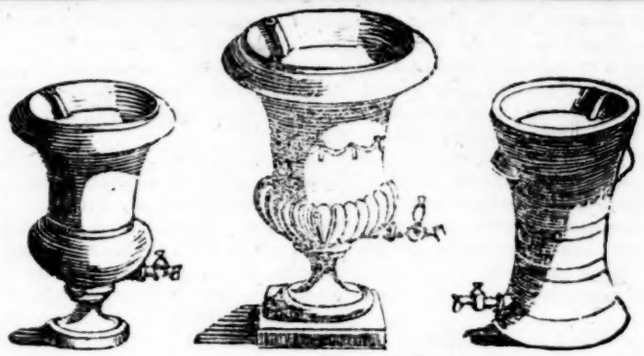
It is said that when the *ham-cutter* at the Vauxhall Gardens died a few years ago, there were numerous applications for the important office. It was found difficult to make a judicious selection without a public trial of skill; accordingly a sharp knife and a ham were set before each candidate, with directions to slice it up, and the ingenious carver, who could cover the largest space with one ham, was to be preferred to the vacant situation. It is added that the successful candidate actually covered *one acre and one rod of ground with a single Westphalia ham.*—[English paper.]

[*From the Georgian.*]

THE ORANGE FLOWER.

"*That most melancholy of all happy ceremonies.*"

All things have their season—and thine, sweet flower!
Comes with the guests at the Bridal hour—
'Tis thine to adorn the fair young Bride,
When she steps forth in her joy and pride—
Thy buds must mix with the snow white pearls
She twines amid her clustering curls;
Thy perfum'd breath is borne on the air,
When she speaks the vow, and breathes the prayer;
The vow which binds, amid smiles and tears,
Her lot to *one* through all coming years,—
In youth and in age, in good and in ill,—
While life shall endure—unchanging still—
The *prayer* that calls on Heaven to bless
The object of her heart's tenderness—
'Tis an hour of joy! yet gaze in her eyes!—
A mist of tears o'er their brightness lies;
And her voice is low, and her cheek is pale
As the light folds of her floating veil—
Does she weep because she must bid adieu
To the home where her happy childhood flew?
Does she mourn that her girlhood's glee is gone,
And that sterner tasks must now come on?
Does she send her spirit through coming years,
When the joy of this hour will be quench'd in tears?
Does her fancy paint that mournful day,
When one fond heart shall be torn away;
When bitter drops from eyes must flow,—
Or else be herself in the grave laid low?
Yes! such feelings will come, unbidden guests,—
When all seems gay to human breasts!
But thou, fair Flower! in thy beauty bright—
Bloom'st fairer still in Beauty's light:—
Thou basking in the sun's warm ray,
And smilest thy little life away,
Protected by *His* bounteous care,
Who made thee in thy beauty there.



PURE WATER—PARKES' PORTABLE FILTERS.—When it is recollected that water may be considered the universal beverage and dissolvent, its purity cannot be considered unimportant. Almost every housekeeper knows the quantity of sediment that adheres to a teakettle which has been used for any considerable time—often near a half inch thick. It will not be surprising that water contains in solution and mixture many foreign ingredients, when we consider that it rests upon or percolates a variety of soil impregnated and mixed with numerous metalic, vegetable, and animal substances.

"Water," says Abernethy, "is of such importance, not only as regards our drink, but also in preparing our food, that it may justly be said to be the vehicle of all our nourishment; so that whenever it possesses bad qualities, no wonder that on its passage through the body various diseases are engendered." Most persons are little aware how very clear, pure, and colorless, common rain or cistern water may be made by filtering. The Medical Advertiser says, "Rain water, when properly filtered, is the purest water that can be obtained." We have often drank rain water that has passed through Mr. Parkes' filters, and have found it the most palateable water usually met with in the sections of country noted for good water.

The filtering vessels are made of the hardest of glazed earthen ware, and of various ornamental patterns.

We select from the circular of Mr. Parkes the following particulars:

"The Patent Filter completely and effectually frees rain water collected from all deleterious earthy substances, and from all other impurities; thus rendering it pure and brilliant, and fit for drink and domestic purposes.

"Spring water has hitherto been used and preferred, but numerous medical authorities pronounce it injurious to health, as it usually holds in solution various earthy and metalic substances.

"The Patent Filter is highly requisite in every private family, hotel, and boarding house; as all kinds of food prepared in filtered rain water *is far more nutricious* than when prepared in spring water.

"The arrangement of the filtering part of this machine is such, that they cannot get out of order for several years, if the instructions furnished by the patentee are attended to.

"The price of the Patent Filters are from eight to twenty dollars, and they will yield from *twelve to forty gallons of pure water* per day. The rapidity of the process being *six times greater* than that of the common filtering stone.

"The Patent Portable Filter can only be purchased at the store of the patentee, 4½ Wall street, New-York: to which place orders may be sent, inclosing a remittance, and they will be carefully packed and forwarded to any part of the world."

NEW PUBLICATIONS.

The Young Gardener's Assistant; containing a Catalogue of Garden and Flower Seeds, with Practical Directions under each Head for the Cultivation of Culinary Vegetables and Flowers. Fourth Edition. With an Appendix, containing Directions for the Cultivating of Fruit Trees, Grape Vines, &c., &c. By T. BRIDGEMAN, Gardener, Seedsman and Florist. New-York, 1833. 12mo—pp. 290.

Although it is true that works on rural affairs in this country, generally, have a sale too limited to remunerate authors, yet there are exceptions, and we are glad this very useful and practical directory has made its re-appearance in a fourth edition. We could wish that every American author who devotes his pen to the important subject of farming and gardening, had the cheering prospect of yet seeing his work run rapidly through several editions.

The list of fruit trees has been selected from the best authorities, both foreign and American, and is sufficiently extensive for any cultivator in this country.

We can assure gardeners and farmers that they will, in times and ways almost without number, be amply compensated by purchasing the book. Mr. Bridgeman bestows great labor on his productions of the pen, not only as to practical matter of fact, but to the various excellencies of style, particularly to clearness, and the avoiding of redundancy of words. The amount of useful information in the book, constitutes its value; and all this information is adapted to this country, and its climate and soil.

American Journal of Science and Arts. Conducted by BENJ. SILLIMAN, M. D. LL. D.

The April number of this valuable periodical is, as usual, replete with interesting and useful information. The variety of matter which it contains, principally original and translated, recommends it to the attention and patronage of all who have taste for scientific information connected with the practical pursuits of life. We recommend to our readers the following extracts as worthy of special notice.

Siliceous glass formed from burning hay.—Extract of a letter dated Watertown, Conn., March, 1833, from Mr. Chester Dutton, to Mr.

Samuel W. S. Dutton, of the Senior Class in Yale College.

"There was a quantity of siliceous glass formed from a stack of hay burned about a year since, within twelve rods of my father's house. Having never been observed before, it gave rise to various conjectures as to its origin. In the American Journal of Science and Arts, Vol. XIX, p. 395, I found a notice of siliceous glass formed from hay, by lightning, copied from Dr. Brewster's Edinburgh Journal. From the style of the notice I should infer that it is a rare occurrence, and on that account interesting. The stack of which this was formed was a large one, and it burned with violence; the hay was all herds-grass, which you know has much silex in its epidermis."

Mr. Dutton was so kind as to hand to us specimens of this glass. It is of a light gray color, porous, vesicular, and inflated like scoriæ of furnaces and glass-houses, and like the upper scum of lava; its lustre is highly vitreous; it is tasteless, and very harsh between the teeth; it scratches window glass with great energy, and has every appearance of having undergone a perfect fusion, doubtless by the aid of the alkali and salts contained in the hay. The resemblance between it and that described in this Journal, in the case cited by Mr. Dutton, is very striking, and, as the statement is supported by credible testimony, there can be no reasonable doubt as to its origin.

Depuration of all sorts of oil and of butter, by Curaudau.—This process is unquestionably the best which has been hitherto published.

Add to one hundred parts of oil ten parts of water, into which one part of flour has been stirred. Shake the mixture well together, and then heat it until all the water is evaporated, or rather until the oil ceases to remain in a state of intimate mixture with the substances which it held in suspension. It is then purified. In the course of twenty-four hours it comes out clear, and differs in no respect in quality from that which has been prepared by the best processes: it has lost all its mucilage.

In performing this process, care must be taken to heat the mixture gradually, and not to raise the temperature above 80° Reaumur (=212° Fahr.) This heat is sufficient to effect the coction of the flour and of the muco-extractive portion of the oil—a stronger heat would color the oil, and thus injure the sale of it.

I was led to this process, observes Curaudau, by an observation which every body may have made, viz.: that a clear white sauce, when overdone, separates into two parts; the one thick, occupying the bottom of the vessel, the other clear, and swimming on the deposit; the first substance is the caseous part of the butter united to the flour, which is added to the sauce and which the coction has separated from the oil; the second is the butter deprived of all foreign ingredients. In this state it may be called depurated or clarified butter. These remarks are altogether applicable to oil and fat.

To this simple observation I owe the idea of purifying oils by flour and water, which affords great advantages.

Lamp oil needs purification to render it fit for combustion. This is no other than depriving it of a muco-extractive substance, which united to the heterogeneous matters that are mingled with it, hinders it from giving, during combustion, a pure light. Since the introduction of the argand lamp, more attention has been given to the purification of oil.

Stucco for walls.—In Italy great use is made of a stucco which gives to walls the brilliancy, the cleanliness, and almost the hardness, of marble. It may be variously colored, to suit the taste of the employer. This stucco is made very easily, by mixing lime and pulverized marble, in nearly equal proportions, according to the meagerness or richness of the marble. A paste or mortar is made of this mixture, and applied to the wall in the thickness of a five-franc piece, with a trowel wet with soap suds, and in such a way that the whole of the wall may be finished in the same day. None but mineral colors should be mixed with the stucco, as the lime would destroy those derived from the vegetable kingdom. To obtain the greatest brilliancy, the mortar should be applied with a cold trowel. Workmen, for the sake of ease and expedition, usually employ it warm. Chips and fragments of marble may be advantageously employed for this purpose. In cases where the appearance of a marble wall would be objectionable on account of its coldness, any portion of it may be covered with paper.

Notes relative to Garden Dahlias, in a letter from Mr. Walner to M. De Candolle.—It is very probable that the Garden Dahlias are hybrids of *D. superflua* and *D frustanea*, for plants are obtained every year by seed from plants which belong to one or the other of these species. I am in the habit of sowing, in separate pots, the grains of each plant and sometimes those of a single fruit. It appears to me that the color of the flowers of the plant which furnishes the seed has little to do with the color of its products.

The form and disposition of the stems vary without end; they are compact, spreading, branching, smooth, glaucous, polished, hairy, and of all colors. One of my correspondents of Hesse-Cassel, Mr. Weller, sent me some leaves of Dahlia much darker than those of *Fagus atropurpurea*. The flowers so large, full, beautiful, of so great a variety of Dahlias, seem to me to be the product of many flowers united in a common calyx and cemented together. They are often seen in every stage of union, and sometimes the peduncles are found in bundles from two to five, so as to be very easily counted.

The full dwarf Dahlias rarely yield seed; but I collected last autumn a few which did.

It is very difficult to ascertain the causes of the color of flowers; for it often happens that the same stem and the same branch give different colors. The same plant entirely changes its color sometimes from one year to another; but this takes place only with the purple, brown and amaranthine colors; they have a tendency to clearer shades, that is to say, to return to their primitive color, the *purple violet*.

What horticulturists call degradation is only an effort of nature to bring back the plant to its primitive type.—[Bib. Univ. Mars, 1832.]

Method of cleansing wool from its grease, and economizing the residue.—M. Darcet, who has long been consulted by manufacturers, advised the following method, which was tried with complete success. Immerse the wool, well washed from dirt, in a vessel containing spirits of turpentine, and let it remain from thirty-six to forty-eight hours. Withdraw and immerse a fresh quantity. By means of a press, force out all the adhering spirit, spread the wool out to dry, and when it is to be used wash it in warm water containing a little alkali.

When the spirits of turpentine will no longer act upon or remove the grease, distil it for fresh use, and the matter remaining in the still, treated with soda, will make good soap.

Cottage Economy; containing information relative to the Brewing of Beer, Making of Bread, Keeping of Cows, Pigs, Bees, Ewes, Goats, Poultry, Rabbits, &c., &c., &c. By Wm. Cobbett. New-York, John Doyle, 1833.

On reading the title page we promised ourselves the pleasure of gleaning many useful items and suggestions for our readers, and thus render a proper return to the publisher for his politeness in sending us the book. But, after perusing near two hundred pages, we were unable to collect the particles of the precious metal now and then observable in the gross ore. We give our readers an idea of the book in saying it is characteristic of its author. You pronounce the book dull, yet you will laugh in reading almost every page—worthless as a whole, yet containing many pleasing and important thoughts—irreligious in its tendency, yet containing excellent advice. The book was designed for England, and therefore more interesting to those on the other side of the Atlantic. The first extract we will give relates to the ladies:

"The drink," says he, "which has come to supply the place of beer has, in general, been tea. It is notorious that tea has no useful strength in it; that it contains nothing nutritious; that it, besides being good for nothing, has badness in it, because it is well known to produce want of sleep in many cases, and in all cases to shake and weaken the nerves. It is, in fact, a weaker kind of laudanum, which enlivens for the moment and deadens afterwards. At any rate it communicates no strength to the body; it does not, in any degree, assist in affording what labor demands. It is, then, of no use. And, now, as to its cost, compared with that of beer. I shall make my comparison applicable to a year, or three hundred and sixty-five days. I shall suppose the tea to be only five shillings the pound; the sugar only seven pence; the milk only two pence a quart. The prices are at the very lowest. I shall suppose a tea-pot to cost a shilling, six cups and saucers two shillings and six pence, and six pewter spoons eighteen pence. How to estimate the firing I hardly know; but certainly there must be in the course of the year two hundred fires made that would not be made, were it not for tea drinking. Then comes the great article of all, the time employed in this tea-making affair. It is impossible to make a fire, boil water, make the tea, drink it, wash up the things, sweep up the fire-place, and put all to rights again, in a less space of time, upon an average, than two hours. However, let us allow one hour; and here we have a woman occupied no less than three hundred and sixty-five hours in the year, or thirty whole days, at twelve hours in the day; that is to say, one month out of the twelve in the year, besides the waste of the man's time in hanging about waiting for the tea! Needs there any thing more to make us cease to wonder at seeing laborers' children with dirty linen and holes in the heels of their stockings? Observe, too, that the time thus spent is, one half of it, the best time of the day. It is the top of the morning, which, in every calling of life, contains an hour worth two or three hours of the afternoon. By the time that the clattering tea tackle is out of the way, the morning is spoiled; its prime is gone; and any work that is to be done afterwards lags heavily along. If the mother have to go out to work, the tea affair must all first be over. She comes into the field, in summer time, when the sun has gone a third part of his course. She has the heat of the day to encounter, instead of having her work done and being ready to return home at an early hour. Yet early she must go, too: for, there is the fire again to be made, the clattering tea tackle again to come forward; and even in the longest day she must have candle light, which never ought to be seen in a cottage (except in case of illness) from March to September.

"Now, then, let us take the bare cost of the use of tea. I suppose a pound of tea to last twenty days; which is not nearly half an ounce every morning and evening. I allow for each mess half a pint of milk. And I allow three pounds of the red dirty sugar to each pound of tea. The account of expenditure would then stand very high; but to these must be added the amount of the tea tackle, one set of which will, upon an average, be demolished every year. To these outgoings must be added the cost of beer at the public-house; for some the man will have, after all, and the woman too, unless they be upon the actual point of starvation. Two pots a week is as little as will serve in this way; and here is a dead loss of nine pence a week, seeing that two pots of beer, full as strong, and a great deal better, can be brewed at home for three pence."

Mr. Cobbett is decidedly an enemy to the potato, which he calls the "lazy Irish root." He recommends cabbages very strongly for cows—says they produce butter of fine flavor. The following paragraph gives us his views of the advantages to the cottager of keeping a pig, and his antipathy towards a denomination of Christians that has done much good in the world:

"The butcher, the next day, cuts the hog up; and then the house is *filled with meat!* Souse, griskins, blade-bones, thigh-bones, spare-ribs, chines, belly-pieces, cheeks, all coming into use one after the other, and the last of the latter not before the end of about four or five weeks. But about this time, it is more than possible that the Methodist parson will pay you a visit. It is remarked in America, that these gentry are attracted by the squeaking of the pigs, as the fox is by the cackling of the hen."

His advice in rearing ducks corresponds, in a measure, with that given on page 110 of our last number:

"No water, to swim in, is necessary to the old, and is injurious to the very young. They never should be suffered to swim (if water be near) till more than a month old. The old duck will lay, in the year, if well kept, ten dozen of eggs; and that is her best employment; for common hens are the best mothers. It is not good to let young ducks out in the morning to eat slugs and worms; for, though they like them, these things kill them if they eat a great quantity. Grass, corn, white cabbages, and lettuces, and especially buck-wheat, cut when half ripe, and flung down in the haulm. This makes fine ducks. Ducks will feed on garbage and all sorts of filthy things; but their flesh is strong, and bad in proportion. They are, in Long Island, fatted upon a coarse sort of crab, called a horse-foot fish, prodigious quantities of which are cast on the shores. The young ducks grow very fast upon this, and very fat; but wo unto him that has to smell them when they come from the spit—and, as for eating them, a man must have a stomach indeed to do that!"

His recommendation to feed sitting hens plentifully is contrary to the practice of most farmers in this country, although it corresponds with the opinion of other writers:

"The hen should be fed exceedingly well, too, while she is sitting and after she has hatched, for though she does not give milk, she gives heat; and, let it be observed, that as no man ever yet saw healthy pigs with a poor sow, so no man ever saw healthy chickens with a poor hen. This is a matter much too little thought of in the rearing of poultry; but it is a matter of the greatest consequence. Never let a poor hen sit; feed the hen well while she is sitting, and feed her most abundantly when she has young ones, for then her labor is very great: she is making exertions of some sort or other during the whole twenty-four hours; she has no rest; is constantly doing something or other to provide food or safety for her young ones."

Our readers will, we presume, be amused with his account of rush-lights:

"We are not permitted to make candles ourselves, and if we were, they ought seldom to be used in a laborer's family. I was bred and brought up mostly by *rush-light*, and I do not find that I see less clearly than other people. Candles certainly were not much used in English laborers' dwellings in the days when they had meat dinners and Sunday coats. Potatoes and taxed candles seem to have grown into fashion together; and, perhaps, for this reason: when the pot ceased to afford grease for the rushes, the potato-gorger was compelled to go to the chandler's shop for light to swallow the potatoes by, else he might have devoured peeling and all!

"My grandmother, who lived to be pretty nearly ninety, never, I believe, burnt a candle in her house in her life. I know that I never saw one there, and she, in a great measure, brought me up. She used to get the meadow-rushes, such as they tie the hop-shoots to the poles with. She cut them when they had attained their full substance, but were still green. The rush at this age consists of a body of pith with a green skin on it. You cut off both ends of the rush, and leave the prime part, which, on an average, may be about a foot and a half long. Then you take off all the green skin, except for about a fifth part of the way round the pith. Thus it is a piece of pith all but a little strip of skin in one part all the way up, which, observe, is necessary to hold the pith together all the way along.

"The rushes being thus prepared, the grease is melted, and put in a melted state into something that is as long as the rushes are. The rushes are put into the grease; soaked in it sufficiently; then taken out and laid in a bit of bark taken from a young tree, so as not to be too large. This bark is fixed up against the wall by a couple of straps put round it; and there it hangs for the purpose of holding the rushes.

"The rushes are carried about in the hand; but to sit by, to work by, or to go to bed by, they are fixed in stands made for the purpose, some of which are high, to stand on the ground, and some low, to stand on a table. These stands have an iron port, something like a pair of pliers, to hold the rush in, and the rush is shifted forward from time to time, as it burns down to the thing that holds it.

"Now, these rushes give a better light than a common small dip-candle; and they cost next to nothing, though the laborer may, with them, have as much light as he pleases, and though without them he must sit the far greater part of the winter evenings in the dark, even if he expend fifteen shillings a year in candles. You may do any sort of work by this light; and, if reading be your taste, you may read the foul libels, the lies and abuse, which are circulated gratis about *me* by the "Society for Promoting *Christian Knowledge*," as well by a rush-light as you can by the light of taxed candles; and, at any rate, you would have one evil less, for to be deceived, and to pay a tax for the deception, are a little too much for even modern loyalty to demand."

First Annual Report of the Society for Promoting Manual Labor in Literary Institutions, including the Report of their General Agent, Th. D. Weld. New-York, 1833—pp. 120.

In comparing the civilized or enlightened with the uncultivated or barbarous portions of the world, the mind is struck with its own potency. It perceives that physical power and moral eminence draw the lines of distinction, and mark the shades of difference, in the families or nations that people the earth, in proportion to the existing mental culture. The uncultivated man pays homage to the elements—the cultivated makes them subservient to the acquisition of power, which renders that of the former pitiable weakness. In moral dignity, too, the distinctive characteristics are in bold relief. Equally so are the kinds and sources of enjoyment. In fact we may reasonably suppose the departed and perfected portion of the human race, in realms of bliss, see here, 'pictured on earth,' the prototypes of the degrees of intellectual eminence in the angelic hosts. If then the culture of mind has been attended with such striking effects, the inquiry arises, are these effects the results of the maximum of mental improvement? By no means: taken collectively, scarcely has the civilized world merged into the full dawn of light.

In respect to the developement of the human intellect, there are two important epochs. The first is the age of Bacon, when the scholastic world was taught to seek for real knowledge in the operations of nature, and not in the disordered brains of a few philosophers. This change has been, down to the present day, diffusing light, and perfecting our system of education. The second epoch is that of our own times, when a union of mental and manual labor is about to take place—when the whole thinking world are being convinced that the full developement of the powers of a human being is as much dependent on the education of the body as of the mind, and of the mind as of the body. The effect of this epoch or change is not merely to increase mental vigor, by giving to the learned more robust constitutions; not merely removing the prejudices existing in a large portion of every community against a liberal education; not merely bringing to bear upon the energies of the human race a vast addition of intellect; but producing an entire change in teaching youth the trades and professions of life. This last is the one great effect which, says our spirit of prophecy, is to be produced by union of mental and physical education. No more shall we see the elasticity and expansiveness of the youthful mind destroyed, by checking and arresting the developement of the bodily organs, during years of incarceration in a school-house; no more shall we see these enfeebled constitutions under the necessity, for years in succession, to undergo, from the rising to the setting sun, the fatigues of bodily confinement or hard labor. While at school the body suffers lassitude, from want of regular systematic exercise; and in learning a trade the mind is inactive from corporeal exertions, and consequently is in an unfit state, even if facilities were afforded, to acquire a knowledge of the principles or science on which the art or trade is founded. On this part of our subject, we must embrace some other opportunity to give our views and feelings more at large; and now hasten to return to the book before us.

The pamphlet is in a great measure composed of the opinions of a large number of our distinguished statesmen, clergymen, physicians, and professors, in favor of the introduction of manual labor into literary institutions. On some of the following subjects the experience and reasonings of more than fifty of the above classes of persons are collected.

The present system of education makes fearful havoc of health and life, effeminates the mind, is perilous to morals, produces an indisposition to effect, and destroys habits of activity and industry, so expensive that its practical effects are anti-republican. The manual labor system furnishes exercise natural to man. It furnishes exercise adapted to interest the mind. Its moral effects would be peculiarly happy. It would furnish the student with important practical acquisitions. It would promote habits of industry—independence of character—originality—is adapted to render permanent all the manlier features of character—would afford to the student facilities in acquiring a knowledge of human nature—greatly diminish the expense of education—would tend to do away those absurd distinctions in society, which make the occupation of an individual the standard of his worth—and to make permanent our republican institutions.

The following paragraph gives the object of the society:

"The society for promoting manual labor in literary institutions was formed in July, 1831, under the conviction that a reform in our seminaries of learning was greatly needed, both for the preservation of health and for giving energy to the character by habits of vigorous and useful exercise. The executive committee, at an early day, appointed Mr. Theodore D. Weld to be general agent of the society, for the term of one year; and were highly gratified by his acceptance of the office. Mr. Weld had been for several years a member of the Oneida Institute, one of the oldest and most successful manual labor schools in the country, and was therefore not only strongly impressed in favor of the system, but also entirely familiar with its details and its practical results."

On reading the following, written by Dr. Bell, of Philadelphia, editor of the Journal of Health, farmers cannot fail of perceiving how admirably calculated their calling is to promote health and general vigor:

"Is agricultural or mechanical labor most healthful for students? My reply is, that the former, or agricultural labor, should, if we can choose, be preferred. Employed in this way, the whole body is more or less called into action; since, in most kinds of field and farm-yard labor, there are successive and alternate movements of the upper and lower limbs; the attitude is either erect, or readily becomes so, between the frequently repeated fits of muscular effort; and the chest has, in consequence, greater freedom for expansion and the inhalation of air, which, moreover, is purer, more vivifying, and cordially stimulating in the fields than in doors. By agricultural labor a person becomes also inured to vicissitudes of the atmosphere, in respect to temperature, and hygrometrical and barometrical states, and is thus saved the many discomforts, and actual disadvantages, to which the mere student and habitually sedentary men are liable, from occasional exposure to extremes and inclemencies of the weather.

"In advocating this kind of employment, I, of course, suppose that a student will not confine himself to one of the many varieties of field and farm-yard labor. Were he to do so, the benefit which I have just stated would not be obtained. A man who should do nothing but plough, would indeed become strong; but he would be awkward, and not unlikely acquire a raised shoulder, and a deviation of his spine from the right line. Similar inconveniences would follow mere mowing and cradling grain.

"Digging and hoeing, *on occasions* excellent exercises, might, if the *exclusive* ones, give an ugly stoop to the individual, and interfere with the dilatation of the chest and freedom of respiration. All these kinds of exercise together, with harrowing, sowing grain by broadcast, cutting down and splitting timber, ought to be had recourse to in due succession, and with a reference to the strength of the student, or to the bodily infirmity from which he wishes either to entirely escape, or, if a sufferer under it, to be cured.

"Most varieties of mechanical labor are attended with the disadvantages of only allowing of the exercise of particular parts of the body. Commonly it is the upper limbs which are in motion, and they with equal force, whilst the lower limbs are entirely quiescent; the posture is either standing or sitting, and too often leaning forward or on one side. The lungs are more apt to suffer, both from the impediment to suitable dilatation of the chest, and the want of fresh, pure air, and likewise from the fine particles given off from the various matters used in the mechanical arts. Most of these objections may, it is true, be obviated by preventing many persons from being at work in the same room; by the constant introduction of fresh and pure air from without; by a change in the labor, so as to require in different days different postures, and varieties of muscular movement."

When the community is convinced that manual labor schools make youth fearless, and capable of the physical exertion recorded in the two succeeding paragraphs, prejudices against a liberal education will rapidly subside:

"To show that the partiality felt by manual labor students for the system does not expend itself in words, I will state a few facts. During a vacation in the Oneida Institute in the winter of 1830, when very few of the students were remaining at the institution, *eleven* of the number subscribed two hundred and forty dollars to the funds of the institution, no one of them subscribing less than $20. This was done entirely of their own accord, without application from any quarter. They knew the seminary was in great need of funds for the erection of buildings, and they coveted the privilege of testifying their hearty approbation of the system by personal sacrifices. These eleven young men immediately set themselves about earning the money; some took jobs at quarrying stone in mid-winter, some at cutting wood, one at mason's work, one at threshing grain, one taught school, some went on agencies, and *all earned their money and paid it.*

"A few months since, two members of the same institution, who had enjoyed the benefits of the manual labor system for some years, and who wished soon to enter upon their professional studies, left the institute with their packs upon their backs, and shaped their course for the Lane Seminary, at Cincinnati, Ohio, the nearest theological institution where manual labor was made *a requisition* and *incorporated into the system.* They travelled on foot to Olean, in the state of New-York, at the head of the Allegany river, hired themselves out to work a raft, descended the river three hundred miles to its junction with the Ohio at Pittsburg, and thence five hundred miles farther to Cincinnati. Upon their arrival they received each twenty-two dollars for their services *as raftsmen.* A few months after four other students of the same institution, upon the same errand, travelled the same route, in the same way. A number more expect soon to start for the same destination, and if rafts are to be found they hope to enjoy the privilege of working their passage."

We cannot conclude our imperfect notice of this pamphlet, and the subject on which it treats, without urging our readers to peruse it: so doing, they cannot fail of perceiving the vast importance attached to the exertions of this Manual Labor Society. All classes of the community are to be benefitted. Like a long and genial shower that extends over the whole land, whose percolating waters reach the deepest fibres, it is destined to bring into action the maximum of health and vigor.

MISCELLANEOUS SELECTIONS.

Turning in Clover for a Wheat Crop.—I shall in this essay treat of the wheat crop, which is the most important of all crops to the farmer. A man who has one hundred acres of cleared land, of common quality, ought to raise on an annual average *one thousand bushels of merchantable wheat*, and also rye, corn, oats, and potatoes, sufficient to defray the expenses of carrying on the farming. The wheat crop should always be *clear gain.*

Don't startle at this, farmer; if you do, it is a sure sign of the improper manner in which you manage your farm. A man who has a farm of one hundred acres of cleared land, can yearly put forty acres of it in wheat, and if the land be in order as it should be, and as every farmer may have it, every acre of the forty will give twenty-five bushels, amounting in the whole forty to one thousand. I shall now shew how land must be farmed in order to produce in this way. Never break your land before harvest and stir it after, as is customary with many farmers. Much ploughing impoverishes land and is productive of no good effects. Your wheat ground must be heavily set in clover, and broken up after harvest with three horses, when the seed in the clover is ripe. By thus turning clover down after harvest, when the seed is ripe, it will never miss coming up in the spring, which frequently is the case when sown in the spring with seed. You also save between forty and fifty dollars worth of seed annually, which it would take to sow your ground. When clover is ploughed down after harvest, before you seed the field, you must harrow it with a light harrow the way you have ploughed it, in order to level the ground and prevent the seed when sown from rolling between the furrows, and coming up in rows. Never plough your seed in with shovels, nor harrow it in across the ploughing, when you have turned down clover after harvest, lest you raise the clover, but always harrow it in by twice harrowing with light harrows the way you have broken up your ground. Many farmers have ploughed down clover once, and finding that their crop was not bettered by it, but injured as they believed, have never attempted it again. This is almost invariably the case the first time clover is ploughed down after harvest, especially if the fall be dry and the winter frigid and close. In turning clover down you necessarily must plough the ground deep, and the first time you do it you turn up the clay, which being unmixed with manure of any sort on top, it is in a bad state to sow wheat in. The wheat after some time will sprout and come up, but will look yellow and very spindling. Its roots, after some time, will get down among the unrotted clover, and there will choak, and for want of moisture a great deal of the wheat will dwindle away and die. The unrotted clover, too, below, will keep the ground loose and springy, so that the frost will injure the wheat no little. But when clover is ploughed down a second time on a field, those bad effects to the wheat crop, arising from unrotted clover, are not experienced. You then turn up the clover from below, which was ploughed down before and which is a manure on the top. The seed sown on it now springs up directly, and before the winter sets in has taken deep root, and spread in large green flourishing branches. The clover now turned down rots very soon, in consequence of the rotten clover turned up, which, as manure, always keeps the ground moist, however dry the fall. You may go on now in this way farming: every time you turn up a coat of clover, turn down one, and your wheat crop will never fail, until your land become so rich that you will have to reduce it with corn.—[Hagerstown Torch-light.]

Formation of Character.—A taste for useful reading is an effectual preservative from vice. Next to the fear of God implanted in the heart, nothing is a better safeguard than the love of good books. They are the hand-maids of virtue and religion. They quicken our sense of duty, unfold our responsibilities, strengthen our principles, confirm our habits, inspire in us the love of what is right and useful, and teach us to look with disgust upon what is low, and grovelling, and vicious. It is with good books as it is with prayer; the use of them will either make us leave off sinning, or leave off reading them. No vicious man has a fondness for reading. And no man who has a fondness for this exercise is in much danger of becoming vicious. He is secured from a thousand temptations to which he would otherwise be exposed. He has no inducement to squander away his time in vain amusements, in the haunts of dissipation, or in the corrupting intercourse of bad company. He has a higher and nobler source of enjoyment to which he can have access. *He can be happy alone;* and is indeed never less alone, than when alone. Then he enjoys the

sweetest, the purest, the most improving society, the society of the wise, the great, and the good; and while he holds delightful converse with these, his companions and friends, he grows into a likeness to them, and learns to look down, as from an eminence of purity and light, upon the low-born pleasures of the dissipated and profligate.

The high value of mental cultivation is another weighty motive for giving attendance to reading. What is it that mainly distinguishes a man from a brute? Knowledge. What makes the vast difference there is between savage and civilized nations? Knowledge. What forms the principal difference between men as they appear in the same society? Knowledge. What raised Franklin from the humble station of a printer's boy to the first honors of his country? Knowledge. What took Sherman from his shoemaker's bench, gave him a seat in Congress, and there made his voice to be heard among the wisest and best of his compeers? Knowledge. What raised Simpson from the weaver's loom, to a place among the first of mathematicians; and Herschel, from being a poor fifer's boy in the army, to a station among the first of astronomers? Knowledge. Knowledge is power. It is the philosopher's stone—the true alchemy that turns every thing it touches into gold. It is the sceptre that gives us our dominion over nature: the key that unlocks the store of creation, and opens to us the treasures of the universe.

Proceedings of the New-York State Agricultural Society, at the first Anniversary held at Albany on the 14th and 15th Feb. 1833.

[Continued from page 112.]

Communication from JESSE BUEL, *Esq. on the Culture of Indian Corn.*

There is no crop more beneficial to the American farmer than Indian corn. An eminent agriculturist, the late John Taylor, of Virginia, called it the "meal, meadow, and manure," of the farm. It is convertible into human food in more forms than any other grain; its value in fattening domestic animals is not exceeded by any product of the farm; and no crop returns more to the soil than this does in the form of manure. There are two important requisites, however, to its *profitable* cultivation. The first is, that the soil be adapted to its growth; and the second, that the crop be well fed and well tended: for food and attention are as important to the plant as to the animal. Ordinarily speaking, it costs less to take care of a good crop of corn, on proper corn land, than it does of a bad crop on land not adapted to its culture. The first is light and dry. The latter stiff, wet, or grassy. I put the average expense of cultivating and securing an acre at $15,* including a fair rent, though it ordinarily exceeds this sum. The farmer, therefore, who obtains thirty bushels from the acre, estimating the grain at 50 cents per bushel, gets a fair compensation for his labor, and the use of his land. Whatever the product falls short of this is an absolute loss; and whatever it may exceed it is net gain. Thus the man who gets but twenty bushels from the acre loses, upon this estimate, $20 worth of his labor, on four acres. He who raises 80 bushels an acre, on the other hand, realizes a net profit of $100 from four acres—making a difference in the profits of the two farmers, in the management of four acres of corn, of *one hundred and twenty dollars!* These data are sufficiently accurate to show the importance of the two requisites I have suggested, and the value of a little calculation in the business of farming. The habit of noting down the expense, as well as the product of a crop, and thus ascertaining the relative profit and loss, is highly advantageous to the practical farmer, and one which cannot be too strenuously inculcated. It will perhaps be said, that I ought to add the value of the manure which is employed in the large crop; but I reply, that I offset this against the increased forage which this crop furnishes. Besides, by applying the manure in the unfermented state in which it is generally found in the spring, it will be as beneficial to the succeeding crops as though it had lain and fermented in the yard, and been applied in the usual way in the autumn.*

The soils adapted to the culture of Indian corn are such as are permeable to heat, air,† and the roots of the plant, and embrace those denominated sandy, gravelly, and loamy. Corn will not succeed well on grounds that are stiff, hard, or wet. The roots grow to as great a length as the stalks, and the soil must be permeable to permit their free extension.

The manures used are generally yard and stable dung, and plaster of paris, (*sulphate of lime.*) The first ought to be abundant, as upon the fertility which it induces depends the profit of the crop. Long or unfermented manure is to be preferred. It decomposes as the wants of the plant require it; while its mechanical operation, in rendering the soil light and porous, is beneficial to the crop. It should be equally spread over the whole surface, before it is ploughed under. It then continues to afford fresh pasture to the roots till the crop has matured, and is in its place to benefit the succeeding crop. If put into the hills, the roots soon extend beyond its influence, it does not so readily decompose, and the subsequent crop is prejudiced from its partial distribution in the soil. In a rotation of four or five years, in which this crop receives the manure, twenty-five or thirty ordinary loads may be applied to *one* acre with greater profit than to *two* or *three* acres. Every addition tells in the product; and there is scarcely any danger of manuring too high for this favorite crop. Gypsum is applied broadcast before the last ploughing or harrowing, or strewed on the hills after hocing. I pursue the first method, at the rate of a bushel to the acre.‡

The best preparation for a corn crop is a clover or other grass lay, or lea, well covered with a long manure, recently spread, neatly ploughed, and harrowed lengthwise of the furrow. A roller may precede the harrow with advantage. The time of performing these operations depends upon the texture of the soil, and the quality of the sod. If the first is inclined to clay, or the latter tough or of long continuance, the ploughing may be performed the preceding autumn; but where sand or gravel greatly preponderate, or the sod is light and tender, it is best performed in the spring, and as near to the planting as convenient. The harrow at least should immediately precede planting. All seeds do best when put into the fresh stirred mould. Stiff lands are ameliorated and broken down by fall ploughing; but light lands are rather prejudiced by it. When corn is preceded by a tilled crop the ground should be furrowed, and the seed deposited in the bottoms of the furrows. Where there is a sod, the rows should be superficially marked, and the seed planted upon the surface. Where the field is flat, or the sub-soil retentive of moisture, the land should be laid in ridges, that the excess of water which falls may pass off in the furrows.

The time of planting must vary in different districts and in different seasons. The ground should be sufficiently warmed by vernal heat to cause a speedy germination. Natural vegetation affords the best guide. My rule has been to plant when the apple is bursting its blossom buds, which has generally been between the 12th and 20th of May.

Preparation of the Seed. The enemies to be combatted are the wire-worm, brown grub, birds and squirrels. Of these the first and two last prey upon the kernels, and against these tar offers a complete protection. I soak my seed 12 to 20 hours in *hot* water, in which is dissolved a few ounces of crude saltpetre, and then add (say to 8 quarts of seed) half a pint of tar, previously warmed and diluted with a quart of warm water. The mass is well stirred, the corn taken out, and as much plaster added as will adhere to the grain. This impregnates and partially coats the seed with the tar. The experience of years will warrant me in confidently recommending this as a protection for the seed.

The manner of planting is ordinarily in hills, from two and a half to six feet apart, according to the variety of corn, the strength of the soil, and the fancy of the cultivator. The usual distance in my neighborhood is three feet. Some, however, plant in drills of one, two, and three rows, by which a greater crop is unquestionably obtained, though the expense of culture is somewhat increased.*

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* *Estimated expense of cultivating an acre of Indian corn:*

One ploughing, (suppose a clover lay)	$2 00
Harrowing and planting,	2 00
Two hoeings, 4 days and horse team,	3 75
Harvesting, 2 days,	1 50
Cutting and harvesting stalks,	1 50
Rent,	5 00
	—$15 75

* Stable and yard manures lose 50 per cent. by the fermentation they undergo in the yard during the summer. This loss consists of the gases which are evolved in the process of rotting, and of the fluids which sink into the earth, or are carried off by the rains. Plants receive their food either in a gaseous or liquid form. If manure rots in the soil, neither these gases or fluids are lost: the earth retains, and the roots of the plants imbibe them. Yet recent manures are not proper to be applied to small grains. They cause too rank a growth of straw, and are apt to induce rust and mildew. Thus a crop of corn, potatoes, or ruta baga, may be *fed* and *fattened*, if I may use the expression, upon the dung which is destined to nourish the wheat crop, without deteriorating its value for the latter purpose, if it is applied to the corn, &c. before it has fermented.

† We are on the northern border of the maize zone, and should make up for defect in climate by selecting soils into which the heat readily penetrates. Air, besides conveying warmth in summer, imparts fertility by the vegetable food which is always suspended in it in the form of gases. Dews are also charged with these properties of vegetable nutriment, and, when the soil is porous, they settle down as in a sponge, and impart fertility to the roots (the true mouths) of plants.

‡ I adopt the opinion of Davy, as the *modus operandi* of plaster of paris, that it forms a necessary constituent of plants which it benefits, and is of no direct benefit to plants which do not afford it on analysis. Among the first are the clovers, corn, potatoes, and generally such plants as have broad or succulent leaves; while the latter embrace culmiferous grains and grasses, as wheat, rye, timothy, &c. Critical observation for years has confirmed me in this conclusion. Gypsum must be rendered soluble before it can be taken up by the mouths of plants, and it requires 600 parts of water to dissolve one of this mineral. I infer from these facts that, by burying it in the soil, it more readily dissolves, and is more accessible to the mouths of plants than if spread upon the surface of the ground. I am induced, from these views of the subject, to sow plaster, on grass grounds, in March, and upon corn and potato grounds before the last ploughing for these crops. The latter was recommended and practised by the distinguished agriculturists, the late Mr. Taylor, of Virginia, and Judge Peters, of Pennsylvania.

* The following table exhibits the difference in product of various methods of planting, and serves also to explain the manner in which large crops of this grain have been obtained. I have assumed in the estimate that each stock produces one ear of corn, and that the ears average one gill of shelled grain. This is estimating the product low; for while I am penning this (October) I find that my largest ears give two gills, and 100 fair ears half a bushel of

The quantity of seed should be double, and may be quadruple,* what is required to stand. It is well known that a great difference is manifest in the appearance of the plants. Some appear feeble and sickly, which the best nursing will not render productive. The expense of seed, and the labor of pulling up all but three or four of the strongest plants in a hill, it is believed will be amply remunerated by the increased product. If the seed is covered as it should be, with fine mould only, and not too deep, we may at least calculate upon every hill or drill having its requisite number of plants.

The after culture consists in keeping the soil loose and free from weeds, which is ordinarily accomplished by two dressings, and in thinning the plants, which latter may be done the first hoeing, or partially omitted till the last. The practice of ploughing among corn, and of making large hills, is justly getting into disrepute: for the plough bruises and cuts the roots of the plants, turns up the sod and manure to waste, and renders the crop more liable to suffer by drought. The first dressing should be performed as soon as the size of the plants will permit, and the best implement to precede the hoe is a corn harrow, adapted to the width of the rows, which every farmer can make. This will destroy most of the weeds and pulverise the soil. The second hoeing should be performed before or as soon as the tassels appear, and may be preceded by the corn harrow, a shallow furrow of the plough, or, what is better than either, by the cultivator.† A slight earthing is beneficial, providing the earth is scraped from the surface, and the sod and manure not exposed. It will be found beneficial to run the harrow or cultivator a third and even a fourth time, between the rows, to destroy weeds and loosen the surface, particularly if the season is dry.‡

In harvesting the crop, one of three modes is adopted, viz. 1. The corn is cut at the surface of the ground, when the grain has become glazed, or hard upon the outside, put immediately into stocks, and when sufficiently dried, the corn and stalks are separated and both secured. 2. The tops are taken off when the corn has become glazed, and the grain permitted to remain till October or November upon the buts. Or, 3. Both corn and stalks are left standing till the grain has fully ripened, and the latter become dry, when both are secured. There are other modes, such as leaving the buts or entire stalks in the field, after the grain is gathered; but these are so wasteful and slovenly as not to merit consideration. The stalks, blades, and tops of corn, if well secured, are an excellent fodder for neat cattle. If cut, or cut and steamed, so that they can be readily masticated, they are superior to hay. Besides, their fertilizing properties, as a manure, are greatly augmented by being fed out in the cattle yard, and imbibing the urine and liquids which always there abound, and which are lost to the farm, in ordinary yards, without an abundance of dry litter to take them up. By the first of these methods, the crop may be secured before the autumnal rains; the value of the fodder is increased, and the ground is cleared in time for a winter crop of wheat or rye. The second mode impairs the value of the forage, requires more labor, and does not increase the quantity or improve the quality of the grain. The third mode requires the same labor as the first, *may* improve the quality of the grain, but must inevitably deteriorate the quality of the fodder. The corn cannot be husked too promptly after it is gathered from the field. If permitted to heat, the value of the grain is seriously impaired.*

Saving Seed. The fairest and soundest ears are either selected in the field or at the time of husking, a few of the husks being left on, braided, and preserved in an airy situation till wanted for use.

In making a choice of sorts, the object should be to obtain the varieties which ripen early, and afford the greatest crop. I think these two properties are best combined in a twelve-rowed kind which I obtained from Vermont some years ago, and which I call Dutton corn, from the name of the gentleman from whom I received it. It is earlier than the common eight-rowed yellow, or any other field variety I have seen, and at the same time gives the greatest product. I have invariably cut the crop in the first fourteen days of September, and once in the last week in August. The cob is large, but the grain is so compact upon it, that two bushels of sound ears have yielded five pecks of shelled grain, weighing 62 lbs. the bushel.

In securing the fodder, precaution must be used. The buts become wet by standing on the ground, and if placed in large stacks, or in the barn, the moisture which they contain often induces fermentation and mouldiness. To avoid this I put them first in stacks so small that the whole of the buts are exposed upon the outer surface; and when thoroughly dry they may be taken to the barn, or left to be moved as they are wanted to be fed out—merely regarding the propriety of removing a whole stock at the same time.

CULTURE OF THE VINE.—For some years past, (says a correspondent of the American Farmer, under date of Baltimore, March 20, 1833,) my attention has been drawn to the cultivation of the vine, as the means of giving to our country a new agricultural product, which, supplying the farmer with a wholesome beverage, and adding to his resources, may take the place of whiskey with the generations that are to come.

I have reluctantly convinced myself, that we shall never be able to produce from our native vines, in this latitude, a wine that will be fit to drink—and indeed, I may say that it has never been my lot to taste a sample of wine from our grapes which could give place for hope. On the other hand, the severity of our climate, during the winter and spring months, proves fatal to almost all imported varieties. I have sought, therefore, with great earnestness, for a foreign vine which combines the hardihood of some of the Rhenish vines with those qualities which are necessary for the vat. That *desideratum* has, I think, at length been found in the Herbemont Madeira or Warrenton grape. In No. 50, vol. xiv. of the American Farmer, Mr. Thomas McCall, of Georgia, has traced it satisfactorily to a foreign origin, and it indeed possesses many of the qualities of the best foreign wine grapes I have ever seen. It is an abundant bearer, the bunches are generally perfect, and if left to become quite ripe, it is not unlike, in flavor and appearance, the Miller's Burgundy.

In the spring of 1831, I received from Mr. Herbemont five hundred roots, very well put up and in the finest condition. I had them carefully planted at eight feet apart one way and six the other, and pruned to two buds each. The growth of the vines was very luxuriant and beautiful. Nothing more was done but to keep them free from weeds and tie up the leading shoots. The wood ripened well, and no further attention was paid to them until March, 1832, when they were again pruned to three or five buds each. Two only had died; and these were indifferent plants through the summer. I consider this a sufficient proof that they will stand our winters, for that of 1832 was severe.

They were again pruned about ten days since; I have carefully examined them, and perceive throughout that perfect *coupe*, which to a French vigneron is a sure indication of health and promise.

I have reason to believe that I shall be able this fall to make some barrels of wine as an experiment.

SCHOOLS IN MISSISSIPPI.—A writer in the Natchez Journal calculates that there are between 7000 and 8000 children in that State, of a suitable age to attend common schools, who receive little or no instruction; while there are sections of land in each township, allowed by Congress for the support of schools, amounting to 800,000 acres in the whole, and which he thinks might be sold for $2,000,000.

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shelled corn. The calculation is also predicated upon the supposition that there is no deficiency in the number of stocks, a contingency pretty sure on my method of planting.

		Hills.	*bush.*	*qts.*
1.	An acre, in hills 4 feet apart, will produce, each way, -	2722	42	16
2.	The same, 3 by 3 feet, - -	4840	75	20
3.	The same, 3 by 2½ feet, -	5808	93	28
4.	The same in drills, at 3 ft. plants 6 in. apart, in the drills, - *Stalks*	29,040	113	14
5.	The same in do. 2 rows in a drill, 6 in. apart, and the plants 9 in. and 3 ft. 9 in. from centre of drills thus,	30,970	120	31
6.	The same in do, 3 rows in a drill, as above, 3 ft. from centre of drills,	43,560	170	5

The fifth mode I have tried. The ground was highly manured, the crop twice cleaned, and the entire acre gathered and weighed accurately the same day. The product in ears was 103 baskets, each 84 lbs. net, and 65 lbs. over. The last basket was shelled and measured, which showed a product on the acre of 118 bushels 10 qts. I gathered at the rate of more than 100 bushels the acre, from 4 rods planted in the third method, last summer, the result ascertained in the most accurate manner. Corn shrinks about 20 per cent. after it is cribbed. The sixth mode is the one by which the Messrs. Pratts, of Madison county, obtained the prodigious crop of 170 bushels per acre. These gentlemen, I am told, are of opinion that the product of an acre may be increased to 200 bushels.

* I am told the Messrs. Pratts, above alluded to, used seven bushels of seed to the acre, the plants being subsequently reduced to the requisite number.

† The cultivator is made in the form of a triangular harrow, with two bulls; or if intended to be graduated to different widths, a centre bull is added, to which the exterior ones are attached by hinges. Iron slats, fixed to the exterior bulls, pass through a mortice in the centre one, perforated with holes, through which an iron pin passes to hold them at the graduated width. The teeth may be in any approved form, or reasonable number. The cultivator I use has five teeth, two in each of the outward and one upon the centre timber. The teeth have a stout shank, with a duck's foot termination, four inches broad, somewhat cylindrical, rounded at the point, and inclined forward in an angle of 30 or 40 degrees. This implement is useful for other purposes; and may be used, like Beatson's, as a substitute for the plough, in preparing light soils for a crop. The handles are attached to the centre piece. The teeth have a shoulder, on the under side of the timber, and are fastened with screws and nuts above.

‡ Some entertain a mistaken notion, that it is prejudicial to stir the soil among corn in dry weather, and others that weeds serve to prevent the evaporation of moisture by a hot sun. The reverse of these opinions is true. The exhaustion of moisture by a plant is in the ratio of the surface of its leaves and stocks presented to the sun and air.

* The leaves are the necessary organs for elaborating the food of plants, and when these are taken away the plant must cease to grow. The sap is useless until it undergoes elaboration in the leaves. Hence, when corn is topped in the usual way, the supply of food is cut off from the grain, except what may be elaborated in the husks. On comparing corn gathered by the first and second modes, it was the opinion of those who assisted in husking, that the first was soundest, brightest, and heaviest. The third mode I have not tried, but it seems probable that the grain might acquire an increase of volume, though it would lose again by depredation and waste. The first method has these further advantages, that it preserves the cob from being saturated with rains, and secures the fodder when in its highest perfection and greatest quantity.

On Setting Wheat.—This is a method which is reckoned one of the greatest improvements in husbandry that was made during the last century.

It seems to have been first suggested by planting grain in a garden for mere curiosity, by persons who had no opportunity of extending the cultivation for profit. This was first attempted at Norwich, and a few years after by one of the largest occupiers of land in Norfolk, who set fifty-seven acres in one year. His success from the visible superiority of his crop, both in quantity and quality, was so great, that in the following autumn he set 300 acres, and has continued the practice ever since. This noble experiment established the practice, and was the means of introducing it generally among the intelligent farmers in a very large district; there being few who now sow any wheat, if they can procure hands to set it. It has been generally observed, that although the set crops appear very thin during the autumn and winter, the plants tiller and spread prodigiously during the spring. The ears are indisputably larger, without dwarfish or small corn; the grain is of a larger bulk, and specifically heavier per bushel than when sown. The lands on which this method is particularly prosperous, are either after a clover stubble, or on which trefoil and grass seed were sown the spring before the last. These grounds, after the usual manuring, are once turned over with the plough in extending flag or turf, at ten inches wide; along which a man, who is called a dibbler, with two setting irons somewhat bigger than ramrods, but considerably larger at the lower end, and pointed at the extremity, steps backwards along the turf, and makes the holes about four inches asunder every way, and one deep. Into these holes the droppers (women, boys, and girls,) drop two grains, which are quite sufficient. After this, a gate bushed with thorns is drawn by one horse over the land, and closes up the holes. By this mode three pecks of grain are sufficient for an acre; and being immediately buried, are equally removed from vermin or the power of frost. The regularity of its rising gives the best opportunity of keeping it clear from weeds, by weeding or hand hoeing. Setting of wheat is a method peculiarly beneficial when corn is dear; and if the season is favorable, may be practised with great benefit to the farmer. Sir Thomas Beevor, of Hethel Hall, in Norfolk, found the produce to be two bushels per acre more than from the sown wheat; but having much less smaller corn intermixed with it, the sample is better, and always fetches a higher price, to the amount generally of 2s. per quarter. This method, too, saves to the farmer and the public six pecks of seed wheat in every acre; which, if generally adopted, would of itself afford bread for more than half a million of people. Add to these considerations the great support given to the poor by this second harvest, as it may be called, which enables them to discharge their rents and maintain their families without having recourse to the parish. The expense of setting by hand is now reduced to about six shillings per acre; which, in good weather, may be done by one dibbler, attended by three droppers, in two days. This is five shillings per day; of which, if the dibbler gives to the children sixpence each, he will have himself 3s. 6d. for his day's work, which is more than he can earn by any other labor so easy to himself. But if he have a wife who dibbles with him, and two or three of his own children to drop to him, his gains will then be very important, and enough to insure a plenty of candidates for that work, even in the least populous parts of the country. But the profit of this method, in seasons when seed corn is very cheap, or the autumn particularly unfavorable to the practice, must certainly be lessened.

This, then, is one of the improved methods of farming which the Agricultural Employment Institution ought to adopt. Transplanting wheat is another source of employment for the redundant poor, the beneficial results of which may be seen at the Exhibition of Arts, Charing Cross, sent there by Mr. E. J. Lance, of Lewisham.—[British Farmer's Magazine.]

Farming in Iceland.—The most important branch of rural labor in Iceland is the hay-making. About the middle of July the peasant begins to cut down the grass of the tun, (the green around his house,) which is immediately gathered to a convenient place, in order to dry, and, after having been turned once or twice, is conveyed home on horseback to the yard, where it is made up into stacks. At the poorer farms, both men and women handle the scythe; but in general, the women only assist in making the hay after it is cut. In many parts of the island, where there is much hay, the peasants hire men from the fishing plains, who are paid for their labor at the rate of thirty pounds of butter a week. They cut by measurement; the daily task being about thirty square fathoms. Hay-harvest being over, the sheep and cattle that had been out all summer on the mountains are collected; the houses are put into a state of repair for the winter; the wood needed for domestic purposes is brought home to each farm; the turf is also taken in. During the winter, the care of the cattle and the sheep devolves entirely on the men; and consists chiefly in feeding and watering the former, which are kept in the house, while the latter are turned out in the day time to seek their food through the snow. When the snow happens to be so deep that they cannot scrape it away themselves, the boys do it for them; and as the sustenance thus procured is exceedingly scanty, they generally get a little of the meadow hay about this time. The farm hay is given to the cows alone. All the horses, excepting, perhaps, a favorite riding horse, are left to shift for themselves the whole winter, during which season they never lie down, but rest themselves by standing in some place of shelter.—[Henderson's Iceland.]

Agriculture in Ohio.—We learn from the Ohio Register, that the Legislature of that state, at its recent session, passed an act to authorize and encourage the establishment of Agricultural Societies, in the several counties of that state, and for other purposes. This act makes it the duty of county commissioners, to give notice in the newspapers, at their June session, that there will be a meeting on the last Friday of said month, for the purpose of forming a County Agricultural Society. If there shall assemble 20 or more persons, they may form a society. The society shall meet annually on the same day. The officers shall be a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, and ten Directors, to hold their offices one year. The President, Directors and Treasurer, to make the by-laws. No member shall be compelled to pay more than $5 per year; all money raised to be applied to the advancement and encouragement of Agriculture, Horticulture, raising the best animals, and the production of such other articles of domestic growth, as the Directors may think proper. County commissioners may appropriate $50 per year to the Society. The Directors must meet on the 3d Saturday in November, annually, and make out full reports of the effects of the Society upon the Agricultural interests, &c., and transmit them to the Chairman of the Committee on Agriculture, in either house of the General Assembly.

Madder.—This is an article of great importance to manufacturers, in procuring red coloring matter, and it is one which may be raised profitably by our farmers. Mr. Russel Browson, of Bridgewater, has published in the New-England Farmer, the method employed by him and his neighbors in cultivating it, and we submit the following abridgment to our readers, in hopes that it may lead some of them to consider whether it would be a profitable business or not.

The soil should be rich, deep and loamy; it should be ploughed very deep twice in the fall and left rough over winter, and rough again in April. The planting should be done in the latter part of April, in hills about six feet apart every way, with two slips in a hill a foot apart. The slips are taken from the old roots in the fall, and may be transported any where, and kept by being buried in a dry piece of ground covered with three or four inches of earth; when planted, and when three inches high, the plot should be weeded and a little earth thrown round the stems of the plants. When six or eight inches high, plough and hoe. The tops fall over on the ridges, and should be laid each way crosswise, and covered with earth, except the ends or buds; in a few weeks they may be spread parallel with the ridges, and should be wed and covered with more earth, the last earthing to be in September. The second season the culture is similar, except that the tops do not lop over till they are a foot high. The earthing should be done in the after part of a dry day. The third season pursue the same course, except no earthing need be done after the first of August, and as soon as the frost has killed the tops, the roots should be dug up, washed thoroughly, partially dried in the sun, and completely dried in a kiln, with a slow heat. The ridges of hills, if well attended to, will be three or four feet broad at the base, and a foot and a half or two feet high, and completely filled with roots, which, after washing and drying, should be ground in the grist mill, when the madder is ready for sale. The whole expense of raising, washing, and grinding, is estimated at 7 cents a pound. It sells at from 22 to 24 cents, leaving a net profit of 15 or 17 cents on a pound. An acre will yield 1500 pounds, or, converted into money, $255 clear profit. Divide this by three, the number of years requisite in bringing it to maturity, and it will yield a net annual profit on an acre of ground of $85. This is no dreamy speculation; it has been realized for some years by farmers in Bridgewater, and can be realized by others if they take up the business. Seed may be obtained of those farmers, at the rate of five dollars a bushel—about five bushels are required for an acre.—[Greenfield Gaz.]

Effect of Removing Fruit Trees.—The facts I shall adduce will be such, and such only, as are capable of being supported by the best testimony.

1st. I can show that a tree sprang up at a distance from a gentleman's house, and was found to produce fruit of a superior quality. The gentleman removed the tree near to his dwelling, and in doing it, entirely altered and spoiled the fruit.

2d. A gentleman was showing me his orchard of about one hundred trees, perhaps more. He told me that the seeds from which that orchard sprang were all taken from an excellent sweet apple; and that in his orchard he had sixteen trees precisely the same as the original apple. I asked him if he was careful to set the tree in the orchard as it stood in the nursery? He told me he did, as near as he could without a compass. Probably with the sixteen he hit the mark.

3d. I know a man who raised a nursery from the seeds of a black gilliflower. He transplanted the trees without any regard to the position of them in the nursery, and not one of them was like the parent. But one that was permitted to remain in the nursery, proved to be a perfect black gilliflower.

4th. I know three trees, now standing in a row, and all produce precisely the same fruit. No one at this day knows what was the quality of the fruit from which the seeds were taken.

5th. In orchards upon strong warm land, at the foot of the Green Mountain, you may find a good proportion of the fruit of a choice quality, while trees from the same nursery, transplanted to the top of the Green Mountain, uniformly produce the worst of fruit.

I have been acquainted with the fruit upon the Green Mountain, through the whole length of it, and have never found a pleasant natural fruit apple.

I would here observe, that a tree grafted or budded in the nursery, will not change the character of its fruit by transplanting.—[Utica Sentinel.]

Starch and Gluten.—The starch and gluten composing wheat can be easily separated, either in the grain or flour. The starch is soluble in water and the gluten is not; consequently, if ker-

nels of wheat be retained in the mouth for a short time, the starch will be dissolved and removed, leaving behind the gluten. Or if a gill of wheat flour be put into a cup, and exposed to repeated washings, pouring off the water after it is applied, it will gradually dissolve, and carry off the starch from the flour, leaving the gluten by itself. The gluten is unlike starch in being insoluble in water, but it is tenacious and elastic, resembling India rubber.

To the gluten we are entirely indebted for light bread. The flour of Indian corn, rice, potatoes, and many other vegetables, though they may be used for bread, can never be raised so as to make light bread. In the process of fermentation in bread, carbonic acid is formed, which is retained only by the gluten, the starch permitting it to escape as fast as made.

The art of making bread, especially light bread, then depends upon diffusing the yeast through it equally; in other words, through kneading it. When that is done, the carbonic acid is generated in nearly equal quantities through the whole mass, the gluten retaining it so as to render the bread uniformly light.

When the yeast is diffused unequally, through the mass, some portions of the dough are raised before others, leaving parts of it unraised, or heavy, while other parts are carried so far perhaps as to become sour.—[Family Lyceum.]

French and English Agriculture, compared.—The following comparative, showing the amount of animate and inanimate power applied to agriculture and commerce in France and Great Britain, is given by Mr. Charles Dupin. He takes the population of France at 31,800,000, and England and Scotland at 15,000,000.

Applied to Agriculture in France.

			Effective Laborers.
Human race,	21,056,667	equal to	8,406,038
Horses,	1,600,000	——	11,200,000
Oxen and cows,	6,973,000	——	17,432,000
Asses,	240,000	——	240,000
Total,			37,278,000

Applied to Agriculture in England and Scotland.

			Effective Laborers.
Human race,	5,000,000	equal to	2,132,446
Horses,	2,250,000	——	8,750,000
Oxen, cows, &c.	5,500,000	——	13,750,000
			24,632,446
Approximating estimate for Ireland,			7,455,701
Total for the United Kingdon,			32,088,147

Applied to the Arts, Manufacture and Commerce.

	In France. Men power.	In Great Britain Men power.
Animate force equal to	6,303,019	7,275,497
Mills and hydraulic engines	1,500,000	1,200,000
Windmills	253,333	240,000
Wind & steam navigation	3,000,000	12,000,000
Steam engines	480,000	6,400,000
Total force,	11,536,352	27,115,497
Approximating estimate for Ireland,		1,002,667
Total force for Great Britain,		28,118,164

By the above estimate it appears that France, with a population of 32,000,000, employs in agriculture, the arts, and commerce, a conjoined animate and inanimate power equal to 48,814,290 able men; and that Great Britain, with its population, (say 28,000,000,) employs a power equal to 60,206,311. That the inanimate power applied in England and Scotland to agriculture is equal to twelve times the human force, while in France it does not exceed five times; that the inanimate power applied to manufacture and commerce in Great Britain is four times greater than in France; and that the whole animate and inanimate power engaged in manufacture and commerce in Great Britain is nearly treble the amount of that so occupied in France.

Potatoe Paste.—Mash boiled potatoes very fine, and while they are warm add a sufficient quantity of butter to make them hold together; then, before the paste gets cold, flour the board to prevent it from sticking, and roll it to the thickness wanted.

Preserved Pippins for daily use.—Take a dozen fair, common sized apples, their weight in sugar (or molasses), with just water enough to dissolve it, which simmer a short time—then put the apples in and boil them a few minutes till tender, grate a little nutmeg over them. They afford a simple and nutricious preserve; but must be prepared every week, as they will not keep long.

Fresh Grapes.—About the 1st of March, the editor of the Long Island Farmer was presented with several clusters of Isabella Grapes, of fine flavor and quality, which had been preserved perfectly fresh, and appeared as plump and tasted as delicious as if just taken from the vines. They were reserved in the following manner: when ripe they were carefully gathered in clusters, and the ends of the stems sealed with common sealing-wax, to prevent the escape of the vinous fluid through the fractured pores; they were then placed in a jar, gently bedded in saw dust which had been kiln-dried, and the pot itself then covered and sealed. We are not aware, says the editor of the Farmer, that this method of preserving grapes is generally known; if it is not, we recommend it to the attention of those who desire the luxury of this species of fruit during the winter and spring.

Ephemeral Apple.—There is a species of apple in Norway, called the glass or transparent apple, which is so delicate, that its daily progress of ripening is obliged to be watched, as it only remains in perfection 12 hours.

Caution to Mushroom Eaters.—On Tuesday the 25th ult. the son of a laboring man residing at Ponsanooth, on returning home from Pengreep, gathered a number of large mushrooms, which he gave to his mother, by whom they were dressed as a stew. The whole family partook of the stew for supper. The woman only ate a little; and the boy by whom the mushrooms were gathered partook more sparingly of the stew than the rest of the family. In the course of the night they were all taken ill. In the morning they sent for an emetic, which they took. Afterwards a medical man was sent for, but he did not arrive till the evening, by which time the younger child, a fine boy of three years of age, died. Every assistance was given to the other sufferers, but, notwithstanding this, two others, a girl about five, and a boy about seven years of age, died on Thursday morning. On Friday a girl of ten years expired; and on Monday last the father, who was supposed to have been better, also died. The mother has not been very ill, owing to her only having tasted the fatal meal; and the boy who gathered the supposed mushrooms was so far recovered on Tuesday as to be able to go to the spot where he found them. On examining some of a similar kind found there, they proved to be large fungi, five or six inches in diameter, sprouting from the stock of an oak tree that had been cut down.—[West Briton.]

To Boil Vegetables.—Vegetables should be perfectly covered with water when boiling, and no time should be lost in draining them the moment they are cooked through.

Potatoes should remain in the hot vessel until the water retained in them has evaporated.

Green vegetables should never be put into the water until it boils. They ought to be boiled quick while uncovered, and removed from the water just as soon as they are cooked through. Onions will be very fine and free from that unpleasant strong taste, when cooked in the following manner: Boil them about one hour in clear water; then drain off the water, and while hot put them into another quantity of water with a little milk and a turnip. Boil them in this water until they become soft, and apply the usual dressing.

We believe this process of cooking onions is not generally known, and having obtained it from an experienced person, whose skill in the art of cookery is amply proved by her table, we recommend the mode to our female friends, as worthy their attention.

Lake of Vitriol.—There is, in the island of Java, a volcano, called Mount Idienne, from which the Dutch East India Company have been often supplied with sulphur for the manufacture of gunpowder. At the foot of this volcano is a vast natural manufactory of that acid commonly called oil of vitriol, although it is there largely diluted with water. It is a lake about 1,200 French feet long; the water is warm, and of a greenish white color, and charged with acid. The taste of this liquid is sour, pungent, and caustic; it kills all the fish of a river into which it flows, gives violent cholics to those who drink it, and destroys all the vegetation on its banks.—[Lardner's Cabinet Cyclopædia.]

Feeding upon Turnips and Straw.—Adam Ferguson gives us, in the Quarterly Journal of Agriculture, the result of feeding two steers twenty-five weeks, upon *turnips and straw*, the turnips half Swedes, or ruta baga. The steers were half and two-thirds short horned blood. No. 1 gained 406 lbs., No. 2 gained 336 lbs. The daily consumption of turnips was about 200 lbs. per day to each animal. I once fed four bullocks about seventy days upon ruta baga, at the rate of two bushels each per day. They ate hardly any thing else, even refusing oil cake. They required no drink. The turnips thus fed produced me about $75.—[Genesee Farmer.]

To boil Peas or Beans.—That dry peas or beans may readily boil soft in hard water, throw a small quantity of sub-carbonate of soda into the vessel in which the dry seeds are put to boil.—[Bull. des Sc. Agri.]

Effects of Slave Labor.—A Virginian will tell you that "all the sources of economical prosperity" in his State are poisoned by slavery. In detail: 1. There is an inertness of most of the springs of prosperity. 2. Free labor cannot co-exist to any extent with slave labor. The white man feels mortified and degraded at the idea of laboring with the slave; he is therefore utterly averse to it, and consequently not only abstracts from society the virtues of industry, but inflicts upon it the vices of idleness. 3. "Agriculture is the best basis of national wealth." Now any system of agriculture, it is well known, instead of improving, deteriorates under the labor of slaves. They do as little work as possible; do it carelessly; they are wasteful. 4. It is only a rich and inexhaustible soil that can bear slave labor. Land of moderate fertility, as in Virginia and other southern and western States, does not repay the expense of the labor of slaves. 5. Slavery is incompatible with a dense white population, which is the strength of a country. 6. Slaves are not (in the opinion of the South, which, whether correct or not, leads to the same practical results) fit for the business of manufactures. 7. Slaves, while they make but coarse mechanics themselves, generally continue to do that work for the plantations, and thus drive out skilful and ingenious mechanics, who by absence are a loss to any community. 8. Slave labor is dearer than free. Slaves have a direct interest in doing and saving as little as possible, while free laborers have a direct interest in producing and saving as much as possible. "The individual who depends on hired labor," says Mr. B. B. Edwards, in a recent lecture, "can procure that labor according to the season of the year, or the nature of the crop, but he who depends on slave labor must maintain the same number of slaves at all seasons of the year, whether he needs their services or not. The *annual cost* of a slave, including the interest of the money at which it is valued in Virginia, is equal to the sum at which a free laborer can be hired in the western counties of that State." Dr. Cooper,

of South Carolina, estimates the labor of a slave to be two-thirds that of a free man. It would of course be cheaper by one-third to employ hired than slave laborers. Mr. Niles, of Baltimore, says that slave labor is profitable nowhere in Maryland; millions of acres of land have been exhausted by slaves. 9. From slave states the whites every year emigrate, but are succeeded by no white emigrants. It is all *out of*, but no *into*. In four months of 1829, 8,000 persons passed through Charlestown, Va., on their way to the west. In 1831, 1,200 persons removed from the single county of Nelson. The estimated value of the real estate of Virginia in 1817 was $206,000,000; in 1829, $96,000,000. Finally, "slavery," says Mr. Harrison in the last number of the American Quarterly Review, from whom many of the above ideas are derived, "begets inevitably a train of habits and opinions which, to say the least, are destructive of all those springs of prosperity, which depend on economy, frugality and enterprise."

Extracts from Lord Brougham's Treatise on the Pleasures and Advantages of Science.

We have seen how wonderfully the *Bee* works according to rules discovered by man thousands of years after the insect had been following them with perfect accuracy. The same little animal seems to be acquainted with principles of which we are still ignorant. We can, by crossing, vary the forms of cattle with astonishing nicety; but we have no means of altering the nature of an animal once born, by means of treatment and feeding. This power, however, is undeniably possessed by the bees. When the queen bee is lost by death or otherwise, they choose a grub from among those which are born for workers; they make three cells into one, and placing the grub there, they build a tube round it; they afterwards build another cell of a pyramidal form, into which the grub grows; they feed it with peculiar food, and tend it with extreme care. It becomes, when transformed from the worm to the fly, not a worker, but a queen bee.

These singular insects resemble our own species, in one of our worst propensities, the disposition to war; but their attention to their sovereign is equally extraordinary, though of a somewhat capricious kind. In a few hours after their queen is lost, the whole hive is in a state of confusion. A singular humming is heard, and the bees are seen moving all over the surface of the combs with great rapidity. The news spreads quickly, and when the queen is restored, quiet immediately succeeds. But if another queen is put upon them, they instantly discover the trick, and, surrounding her, they either suffocate or starve her to death. This happens if the false queen is introduced within a few hours after the first is lost or removed; but if twenty-four hours have elapsed, they will receive any queen, and obey her.

The labors and the policy of the *Ants* are, when closely examined, still more wonderful, perhaps, than those of the *Bees*. Their nest is a city, consisting of dwelling places, halls, streets, and squares into which the streets open. The food they principally like is the honey which comes from another insect found in their neighborhood, and which they, generally speaking, bring home from day to day as they want it. Late discoveries have shown that they do not eat grain, but live almost entirely on animal food and this honey. Some kinds of ant have the foresight to bring home the insects on whose honey they feed, and keep them in particular cells, where they guard them to prevent their escaping, and feed them with proper vegetable matter, which they do not eat themselves. Nay, they obtain the eggs of those insects, and superintend their hatching, and then rear the young insect until he becomes capable of supplying the desired honey. They sometimes remove them to the strongest parts of their nest, where there are cells apparently fortified for protecting them from invasion. In those cells the insects are kept to supply the wants of the whole ants which compose the population of the city. It is a most singular circumstance in the economy of nature, that the degree of cold at which the ant becomes torpid is also that at which this insect falls into the same state. It is considerably below the freezing point; so that they require food the greater part of the winter, and if the insects on which they depend for food were not kept alive during the cold in which the ants can move about, the latter would be without the means of subsistence.

How trifling soever this little animal may appear in our climate, there are few more formidable creatures than the ant of some tropical countries. A traveller, who lately filled a high station in the French government, M. Malouet, has described one of their cities, and, were not the account confirmed by various testimonies, it might seem exaggerated. He observed at a great distance what seemed a lofty structure, and was informed by his guide that it consisted of an ant hill, which could not be approached without danger of being devoured. Its height was from fifteen to twenty feet, and its base thirty or forty feet square. Its sides inclined like the lower part of a pyramid, the point being cut off. He was informed that it became necessary to destroy these nests, by raising a sufficient force to dig a trench all round, and fill it with faggots, which were afterwards set on fire; and then battering with cannon from a distance, to drive the insects out and make them run into the flames. This was in South America; and African travellers have met with them in the same formidable numbers and strength.

The older writers of books upon the habit of some animals abound with stories which may be of doubtful credit. But the facts now stated, respecting the Ant and Bee, may be relied on as authentic. They are the result of very late observations and experiments, made with great accuracy by several most worthy and intelligent men; and the greater part of them have the confirmation arising from more than one observer having assisted in the inquiries.* The habits of *Beavers* are equally well authenticated, and, being more easily observed, are vouched by a great number of witnesses. These animals, as if to enable them to live and move either on land or water, have two web-feet, like those of ducks or water dogs, and two like those of land animals. When they wish to construct a dwelling place, or rather city, for it serves the whole body, they choose a level ground with a stream running through it; they then dam up the stream so as to make a pond, and perform the operation as skilfully as we could ourselves. Next they drive into the ground stakes of five or six feet long in rows, wattling each row with twigs, and pudding or filling the interstices with clay, which they ram close in, so as to make the whole solid and water-tight. This dam is likewise shaped on the truest principles; for the upper side next the water slopes, and the side below is perpendicular; the base of the dam is ten or twelve feet thick; the top or narrow part two or three, and it is sometimes as long as one hundred feet.† The pond being thus formed and secured, they make their houses round the edge of it; they are cells, with vaulted roofs, and upon piles: they are made of stones, earth, and sticks; the walls are two feet thick, and plastered as neatly as if the trowel had been used. Sometimes they have two or three stories for retreating to in case of floods; and they always have two doors, one towards the water, and the other towards the land. They keep their winter provisions in stores, and bring them out to use; they make their beds of moss; they live on the bark of trees, gums, and crawfish. Each house holds from twenty to thirty, and there may be from ten to twenty-five houses in all. Some of their communities are larger than others, but there are seldom fewer than two or three hundred inhabitants. In working they all bear their shares: some gnaw the trees and branches with their teeth, to form stakes and beams; others roll the pieces to the water; others, diving, make holes with their teeth to place the piles in; others collect and carry stones and clay; others beat and mix the mortar; and others carry it on their broad tails, and with these beat it and plaster it. Some superintend the rest, and make signals by sharp strokes with their tail, which are carefully attended to; the beavers hastening to the place where they are wanted to work, or to repair any hole made by the water, or to defend themselves or make their escape, when attacked by an enemy.

The fitness of different animals, by their bodily structure, to the circumstances in which they are found, presents an endless subject of curious inquiry and pleasing contemplation. Thus, the *Camel*, which lives in sandy deserts, has broad spreading hoofs to support him on the loose soil, and an apparatus in his body by which water is kept for many days, to be used when no moisture can be had. As this would be useless in the neighborhood of streams or wells, and as it would be equally so in the desert where no water is to be found, there can be no doubt that it is intended to assist in journeying across the sands from one watered spot to another. There is a singular and beautiful provision made in this animal's foot, for enabling it to sustain the fatigue of journeys under the pressure of its great weight. Beside the yielding of the bones and ligaments, or bindings, which gives elasticity to the foot of the deer and other animals, there is in the Camel's foot, between the horny sole and the bones, a cushion, like a ball, of soft matter, almost fluid, but in which there is a mass of threads extremely elastic, interwoven with the pulpy substance. The cushion thus easily changes its shape when pressed, yet it has such an elastic spring, that the bones of the foot press on it uninjured by the heavy body which they support, and this huge animal steps as softly as a cat.

Nor need we flee to the desert in order to witness an example of skilful structure: the limbs of the *Horse* display it strikingly. The bones of the foot are not placed directly under the weight; if they were in an upright position they would make a firm pillar, and every motion would cause a shock. They are placed slanting or oblique, and tied together by an elastic binding on their lower surfaces, so as to form springs as exact as those which we make of leather and steel for carriages. Then the flatness of the hoof, which stretches out on each side, and the frog coming down in the middle between the quarters, adds greatly to the elasticity of the machine. Ignorant of this, ill-informed farriers nail the shoe in such a manner as to fix the quarters, and cause permanent contraction of the bones, ligaments, and hoof—so that the elasticity is destroyed; every step is a shock; inflammation and lameness ensue.*

The *Rein-deer* inhabits a country covered with snow the greater part of the year. Observe how admirably its hoof is formed for going over that cold and light substance, without sinking in it, or being frozen. The under side is covered entirely with hair, of a warm and close texture; and the hoof, altogether, is very broad,

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* A singular circumstance occasioned this in the case of Mr. Huber, by far the most eminent of these naturalists; he was quite blind, and performed all his experiments by means of assistants.

† If the base is twelve and the top three feet thick, and the height six feet, the face must be the side of a right-angled triangle, whose height is eight feet. This would be the exact proportion which there ought to be, upon mathematical principles, to give the greatest resistance possible to the water in its tendency to turn the dam round, provided the materials of which it is made were lighter than water in the proportion of 44 to 100. But the materials are probably more than twice as heavy as water, and the form of so flat a dike is taken, in all likelihood, in order to guard against a more imminent danger—that of the dam being carried away by being shoved forwards. We cannot calculate what the proportions are which give the greatest possible resistance to this tendency, without knowing the tenacity of the materials, as well as their specific gravity. It may, very probably, be found that the construction is such as to secure the most completely against the two pressures at the same time.

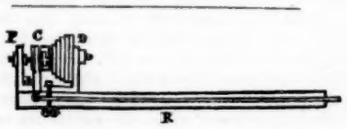
* Mr. Bracey Clark has contrived an expanding shoe, which, by a joint in front, opens and contracts, so as to obviate the evils of the common process.

acting exactly like the snow-shoes which men have constructed for giving them a larger space to stand on than their feet, and thus avoid sinking. Moreover, the deer spreads the hoof as wide as possible when it touches the ground; but, as this breadth would be inconvenient in the air, by occasioning a greater resistance while he is moving along, no sooner does he lift the hoof than the two parts into which it is cloven fall together, and so lessen the surface exposed to the air, just as we may recollect the birds doing with their bodies and wings. The shape and structure of the hoof is also well adapted to scrape away the snow, and enable the animal to get at the particular kind of moss (or *licken*) on which he feeds. This plant, unlike others, is in its full growth during the winter season; and the Rein-deer accordingly thrives from its abundance, at the season of his greatest use to man, notwithstanding the unfavorable effects of extreme cold upon the animal system.

There are some insects of which the males have wings, and the females are grubs or worms. Of these, the *Glow-worm* is the most remarkable: it is the female; and the male is a fly, which would be unable to find her out, creeping as she does in the dark lanes, but for the shining light which she gives, to attract him.

There is a singular fish found in the Mediterranean, called the *Nautilus*, from its skill in navigation. The back of its shell resembles the hulk of a ship; on this it throws itself, and spreads two thin membranes to serve for two sails, paddling itself on with its feet, or feelers, as oars.

The *Ostrich* lays and hatches her eggs in the sands: her form being ill adapted for sitting on them, she has a natural oven furnished by the sand, and the strong heat of the sun. The *Cuckoo* is known to build no nest for herself, but to lay in the nests of other birds; but late observations show that she does not lay indiscriminately in the nests of all birds; she only chooses the nests of those which have bills of the same kind with herself, and therefore feed on the same kind of food. The *Duck*, and other birds breeding in muddy places, have a peculiar formation of the bill: it is both made so as to act like a strainer, separating the finer from the grosser parts of the liquid, and it is more furnished with nerves near the point than the bills of birds which feed on substances more exposed to the light, so that being more sensitive, it serves better to grope in the dark stream for food. The bill of the *Snipe* is covered with a curious net work of nerves for the same purpose; but the most singular provision of this kind is observed in a bird called the *Toucan*, or *Egg-sucker*, which chiefly feeds on the eggs found in birds' nests, and in countries where these are very deep and dark. Its bill is broad and long; when examined, it appears completely covered with branches of nerves in all directions; so that, by groping in a deep and dark nest it can feel its way as accurately as the finest and most delicate finger could. Almost all kinds of birds build their nests of materials found where they inhabit, or use the nests of other birds; but the *Swallow of Java* lives in rocky caverns on the sea, where there are no materials at all for the purpose of building. It is therefore so formed as to secrete in its body a kind of slime, with which it makes a nest, much prized as a delicate food in Eastern countries.



Improvement in the Lathe, by which the work in hand may be examined without stopping. By J. Walker. [From the London Mechanics' Magazine.]

Sir,—In driving the foot lathe I have always found the hardest part of the labor to be the stopping occasionally to examine the work, and then starting anew. To obviate this difficulty I have invented the improvement represented in the accompanying sketch, which, as far as my knowledge extends, is new.

P shows the poppet head with riggers; D the dividing plate, fixed on the mandril with a small collar betwixt it and the riggers; C a small clutch box; L the lever; R a small rod supported at the far end of the bed, connected to C, which enables the turner to throw the riggers out and in gear; allowing them to run loose upon the mandril, so that when examining your work the fly wheel may still go on.

If any of your readers are aware of any similar contrivance, I should be glad to be made acquainted with it, as I am about fitting up a new turning apparatus with the improvement just described.

Chesapeake and Ohio Canal.—Five thousand men and boys, assisted by 850 horses, oxen and mules, and a weekly consumption of 9,000 lbs. of gunpowder, are now urging to a completion 102 miles of the Chesapeake and Ohio Canal. Sixty-four miles are to be in use on the 1st of June, and 102 miles on the 5th of October next.—[Boston Adv.]

Tea Wheat.—The Season.—Extracts from a letter from Elisha Marvin, Esq., of Ripley, N. Y. to the Proprietor of the N. E. Farmer.

The tea wheat which I have sent you I had from the Province of New-Brunswick, soon after it was first noticed in your paper. I have sown this wheat every spring since, from the tenth of March to the first of May. The choice of time depends on the season; a dry season sometimes injures late sowing, for which reason I prefer sowing as soon as the ground will admit.

This grain does well on what we call a natural wheat soil, and just as well on any good soil. In wet or low places in your field, where winter wheat would be killed by ice, or thrown out by frost, this wheat will give a fair crop.

On our dividing ridges, which are generally a wet cold soil, and covered four or five months with deep snow, this wheat does well. Winter wheat, if grown at all in such situations, would give but an indifferent crop, and that of a light and poor quality. The tea wheat weighs 63 pounds to the bushel; other spring wheat, in this region, 58. The tea wheat yields a far better crop than either the bearded or bald spring wheat; and suits much better to every variety of soil. With these advantages I think I can with all safety call the tea wheat the best spring crop of grain we have in this region of country.

Our season is now (March 15) mild. The coldest day the present year was the 2d of March, when the ice in the lake fastened for the first time, and is not yet started.

Prognostics of the Weather.—Rain may be expected when the swallow flies low, and skims backward and forward over the surface of the earth and waters, frequently dipping the tips of her wings into the latter. When, also, bees do not range abroad as usual, or keep in or near their hives, we may expect wet. Before rain, swine, as well as poultry, appear very uneasy and rub themselves in the dust. Before and during rain, ducks, geese, and other water fowl, wash and dive in the water more than usual. If we happen to be abroad, when, after long continued dry weather, the sky is lowering, and rain approaching, we may frequently observe the cattle stretching out their necks, and snuffing in the air with distended nostrils; and often before storms, they assemble in a corner of the field, with their heads to the leeward. Sparrows chirp particularly loud during rain, and often begin before it falls, affording in this manner, for some time previously, an indication of its approach. Mariners at sea expect a storm when the stormy petrels, Procellariæ pelagicæ, shelter themselves in numbers under the wake of the vessel. When the sea gulls come in numbers to the shore, and make a noise about the coast, or, when at sea, they alight on ships, the sailors consider it a sure foreboding of a storm. These circumstances were known of old. Before storms, too, the porpus, dolphin, and grampus, come to the shore in large bodies.

In the economy of nature, we find that plants, like animals, adapt their motions to their wants: some expand their flowers to the sun, and close them at eventide; others expand their flowers in the evening, open before rain, or perform various other functions, the result of their particular natures, and to which the various states of the atmosphere are specific stimuli. From an accurate and constant observance of these, many prognostics of the ensuing weather have been deduced; some of these Mr. Forster inserts, rather, however, on account of their popularity, than because he had noticed most of them himself.

The chickweed has been said to be an excellent weather-guide. When the flowers expand freely, no rain will fall for many hours; if they so continue open, no rain need be feared for a long time. In showery days the flowers appear half concealed, and this state may be regarded as indicative of showery weather; when they are entirely shut we may expect a rainy day. If the flowers of the Siberian sow thistle remain open all night, we may expect rain next day. Before showers the trefoil contracts its leaves, as does the convolvulus, and many other plants To these, the closing of the flowers of the pimpernel, and numerous other floral prognostics, might be added.—[Journal of Health.]

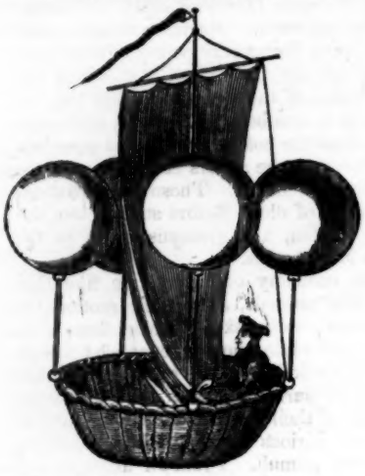
To Prevent Sows Eating their Pigs.—Separate the sow from the rest of the swine six or eight weeks before her bringing forth, so that she may become accustomed to her pen. Care should be taken, however, to have her pen kept dry, and well littered; always give them litter enough so as not to be obliged to give any for six days before the time, for nothing disturbs the sow more than an abundance of litter, and which in my opinion has a great tendency to induce her to destroy her young. If the sow is with the other swine till within a few days of her bringing forth, and then separated, she will not get accustomed to her pen, and, by thus being disturbed, she will be pretty sure to destroy her pigs.

I do not think there is any thing in the breed or nature of sows, unless disturbed or mismanaged, and if so I think it very natural for them to destroy their young.

I have known, and it is not at all uncommon for young sows to destroy their first, and protect their succeeding litters; and I have known them to protect their first and destroy their succeeding litters; but in most cases I find that it is owing to disturbance or mismanagement.

Raw salt pork cut in small pieces, or coarse butchers' meat, and given, will prevent them from eating their pigs. I have seen it given after they had ate two or three of their litter with good success. But to prevent any mischief it should be kept by them at this time.—[New-England Farmer.]

[*From the Mechanics' Magazine and Register of Inventions and Improvements.*]



[We copy the following interesting account of Balloons from "Mr. Partington's British Cyclopædia," a work of unparalleled cheapness and of great merit.]

The idea of inventing a machine which should enable us to rise into the air appears to have occupied the human mind even in ancient times, but was never realized till the last century. The first suggestion for a sailing vessel, with any pretensions to the character of science, is due to Francis Lana, a distinguished Jesuit. This occurred in 1670; and the arrangement of the apparatus will be best understood by referring to the preceding figure.

Lana, it will be seen, proposed to support his car by the aid of four balls. These were to be exhausted of air; and the inventor argued that their diminished weight would cause the balls to support themselves and the aeronaut. We notice this apparatus, as similar schemes have been put forth even within our own times; but it must be obvious to any intelligent mind, that the external pressure of the atmosphere would destroy the vessels, even if they could be rendered light enough. Henry Cavendish having discovered, about 1766, the great levity of inflammable air or hydrogen gas, Dr. Black, of Edinburgh, was led to the idea that a thin bladder, filled with this gas, must ascend into the air. Cavallo made the requisite experiments in 1782, and found that a bladder was too heavy, and paper not air tight. Soap bubbles, on the contrary, which he filled with inflammable air, rose to the ceiling of the room, where they burst. In the same year, the brothers Stephen and Joseph Montgolfier constructed a machine which ascended by its own power. In November, 1782, the elder Montgolfier succeeded, at Avignon, in causing a large bag of fine silk, in the shape of a parallelopiped, and containing 40 cubic feet, to mount rapidly upwards to the ceiling of a chamber, and afterwards, in a garden, to the height of 36 feet, by heating it in the inside with burning paper. The two brothers soon afterwards repeated the experiment at Annonay, where the parallelopiped ascended in the open air 70 feet. A larger machine, containing 650 cubic feet, rose with equal success. They now resolved to make the experiment on a large scale, and prepared a machine of linen, lined with paper, which was 117 feet in circumference, weighed 430 pounds, and carried more than 400 pounds of ballast. This they sent up, June 5, 1783, at Annonay. It rose in ten minutes to a height of 6,000 feet, and fell 7,668 feet from the place of ascension. The method used to cause it to ascend was, to kindle a straw fire under the aperture of the machine, in which they threw, from time to time, chopped wood. But, though the desired effect was produced, they had no clear nor correct idea of the cause. They did not attribute the ascension of the vessel to the rarefaction of the air enclosed in it by the operation of the heat, but to a peculiar gas, which they supposed to be developed by the burning of the straw and wood. The error of this opinion was not discovered till a later period. These experiments roused the attention of all the philosophers of Paris. It occurred to some of them, that the same effect might be produced by inflammable air. M. Charles, Professor of Natural Philosophy, filled a ball of lutestring, 12 feet in diameter, and coated with a varnish of gum-elastic with such gas. It weighed 25 pounds, rose 3,123 feet in two minutes, disappeared in the clouds, and descended to the earth, after three-quarters of an hour, at the village of Gonesse, about 15 miles from Paris. Thus we see two original kinds of balloons: those filled with heated air, and those filled with inflammable air.

The process of filling balloons on the small scale for this species of aerial navigation, will readily be understood by a reference to the accompanying sketch, in which a simple condenser is employed. The common mode is to generate hydrogen gas in a bottle, by pouring dilute sulphuric acid on granulated zinc, but the hot and moist vapor from the acid speedily destroys the balloon. To prevent this, the experimentor has only to employ a second bottle containing water, and carry a bent-pipe from the first bottle through a cork in the second; it dips beneath the surface, and is condensed, and the pure hydrogen ascends by the second pipe to the balloon.

To continue: Montgolfier had gone to Paris, and found an assistant in Pilatre de Rozier, the superintendent of the Royal Museum. They completed together, in October, 1783, a new machine, 74 feet in height, and 48 in breadth, in which Rozier ventured for the first time to ascend, though only 50 feet. The balloon was from caution fastened by cords, and soon drawn down. Eventually the machine, being suffered to move freely, took an oblique course, and at length sunk down gradually about 100 feet from its starting place. By this the world was convinced that a balloon might, with proper management, carry a man through the air; and the first aerial expedition was determined on.

November 21, 1783, Pilatre de Rozier and the Marquis d'Arlandes ascended from the castle la Muette, in the presence of an innumerable multitude, with a machine containing 6,000 cubic feet. The balloon, after having attained a considerable height, came down, in 25 minutes, about 9,000 yards from la Muette. But the daring aeronauts had been exposed to considerable danger. The balloon was agitated very violently several times; the fire had burnt holes in it; the place on which they stood was injured, and some cords broken. They perceived that it was necessary to descend without delay; but when they were on the surface of the earth, new difficulties presented themselves. The weak coal fire no longer supported the linen balloon, the whole of which fell into the flame. Rozier, who had not yet succeeded in descending, just escaped being burnt. M. Charles, who had joined with M. Robert, soon after informed the public that they would ascend in a balloon filled with inflammable air. To defray the necessary expenses of 10,000 livres, he opened a subscription. The balloon was spherical, 26 feet in diameter, and consisted of silk coated with a varnish of gum-elastic. The car for the aeronauts was attached to several cords, which were fastened to a net, drawn over the upper part of the balloon. A valve was constructed above, which could be opened from the car, by means of cords, and shut by a spring. This served to afford an outlet to the inflammable air, if they wished to descend, or found it necessary to diminish it. The filling lasted several days; and, December 1st, the voyage was commenced from the Tuilleries. The balloon quickly rose to a height of 1800 feet, and disappeared from the eyes of the spectators. The aeronauts diligently observed the barometer, which never stood at less than 26°, threw out gradually the ballast they had taken in to keep the balloon steady, and descended safely at Nesle. But as soon as Robert stepped out, and it was thus lightened of 130 pounds, it rose again with great rapidity about 9,000 feet. It expanded itself with such force, that it must have been torn to pieces, had not Charles, with much presence of mind, opened the valve to accommodate the quantity of gas to the rarity of the surrounding atmosphere. After the lapse of half an hour the balloon sunk down on a plain, about three miles from the place of its second ascent.

Another ascent, which nearly proved disastrous to the aeronauts, may now be noticed. On the 15th of July, 1784, the Duke of Chartres, the two brothers Roberts, and another person, ascended with an inflammable air balloon from the park of St. Cloud, at 52 minutes past 7 o'clock in the afternoon. This balloon was of an oblong form, measuring 55½ feet in length, and 34 in diameter. It ascended with its greatest extension nearly horizontal; and after remaining in the atmosphere about 45 minutes, it descended at a little distance from whence it had ascended, and at about 30 feet distance from the *Lac de la Garenne*, in the park of *Meudon*. But the incidents that happened in this aerial excursion deserve to be particularly described, as nothing like it had happened before to any of the aerial travellers. This machine contained an interior smaller balloon, filled with common air; by which means, according to a mode hereafter to be mentioned, the machine was to be made to ascend or descend without any loss of inflammable air or ballast. The boat was furnished with a helm and oars, intended to guide it, &c.

On the level of the sea the barometer stood at 30.25 inches, and at the place of departure it stood at 30.12. Three minutes after its ascending, the balloon was lost in the clouds, and the aerial voyagers lost sight of the earth, being involved in a dense vapor. Here an unusual agitation of the air, somewhat like a whirlwind, in a moment turned the machine three times from the right to the left. The violent shocks which they suffered prevented their using any of the means prepared for the direction of the balloon, and they even tore away the silk stuff of which the helm was made. Never, said they, had a more dreadful scene presented itself to any eye, than that in which they were involved. An unbounded ocean of shapeless clouds rolled one upon another beneath, and seemed to forbid their return to the earth, which was still invisible. The agitation of the balloon became greater every moment. They cut the cords which held the interior balloon, which consequently fell on the bottom of the external one, just upon the aperture of the tube, which went down into the boat, and stopped it up. At this time the thermometer showed a little above 44°. A gust of wind from below drove the balloon upwards, to the extremity of the vapor, when the appearance of the sun showed them the existence of nature; but now, both the heat of the sun and the diminished density of the atmosphere occasioned such a dilation of the inflammable air, that the bursting of the balloon was apprehended; to avoid which they introduced a stick through the tube that proceeded from the balloon, and endeavored to remove from its aperture the inner balloon, which closed it; but the

dilation of the inflammable air pushed the inner balloon so violently against the aperture of the tube, that every endeavor proved ineffectual. During this time they still continued to ascend, until the mercury in the barometer stood not higher than 24.36 inches, which shows their height above the surface of the earth to be about 5,100 feet. In these dreadful circumstances, they thought it necessary to make a hole in the balloon, in order to give an exit to the inflammable air; and the Duke of Chartres, by means of one of the banners, made two incisions, which caused a rent of between seven and eight feet. They then descended very rapidly, seeing at first no object on earth or in the heavens; but a moment after they discovered the fields, and were descending straight towards a lake, into which they must have fallen had they not thrown overboard about sixty pounds weight of ballast, which occasioned their coming down at about thirty feet beyond the edge of the lake. Notwithstanding this rapid descent, occasioned by the great quantity of gas which escaped out of the two rents in the balloon, none of the four adventurers was hurt, but spoke in the highest terms of excitement of the pleasures of their expedition.

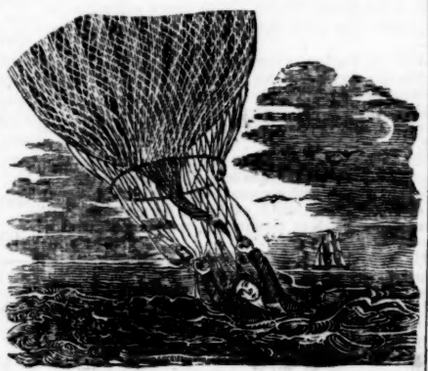
These successful aerial voyages were soon followed by others. Blanchard had already ascended several times, when he determined to cross the channel between England and France, which is about 23 miles wide, in a balloon filled with inflammable air. He succeeded in this bold attempt, January 7, 1785, accompanied by an American gentleman, Dr. Jeffries. About one o'clock they left the English coast, and at half-past two, were on the French. Pilatre de Rozier, mentioned before as the first aeronaut, attempted, June 14, 1785, in company with Mr. Romain, to pass from the French to the English side; but the attempt was unsuccessful, and the adventurers lost their lives. M. de Rozier had on this occasion united the two kinds of balloons; under one, filled with inflammable air, which did not alone possess sufficient elevating power, was a second, filled by means of a coal fire under it. Rozier had chosen this combination, hoping to unite the advantages of both kinds. By means of the lower balloon, he intended to rise and sink at pleasure, which is not possible with inflammable air; for a balloon filled with this, when once sunk to the earth, cannot rise again with the same weight, without being filled anew; while, on the contrary, by increasing or diminishing the fire under a balloon filled with heated air, it can be made to rise and fall alternately. But this experiment caused the death of the projectors. Probably the coals, which were only in a glowing state near the surface of the ground, were suddenly kindled to a light flame as the balloon rose, and set it on fire. The whole machine was soon in flames, and the two aeronauts were precipitated from the air. The condition of their mangled bodies confirms the conjecture that they were killed by the explosion of the gas. This unhappy accident did not deter others; on the contrary, the experiments were by degrees repeated in other countries.

However important this invention may be, it has as yet led to no considerable results. Its use has hitherto been confined to observations in the upper regions of the atmosphere. But should we ever learn to guide the balloon at will, it might, perhaps, be employed for purposes of which we now have hardly an idea; possibly the plan of Professor Robison might be accomplished by the construction of a gigantic balloon, which would enable us to perform an aerial circumnavigation of the earth. During the French Revolution, an aerostatic institution was founded at Meudon, not far from Paris, for the education of a corps of aeronauts, with the view of introducing balloons into armies as a means of reconnoitering the enemy. But this use of balloons was soon laid aside, for, like every other, it must be attended with great uncertainty, as long as the machine has to obey the wind. Among the French, Blanchard and Garnerin have undertaken the greatest number of aerial voyages; among the Germans, Professor Jungius, in Berlin, in 1805 and 1806, made the first. Since that time, Professor Reichard and his wife have become known by their aerial excursions. Even in Constantinople such a voyage was performed, at the wish and expense of the Sultan, by two Englishmen, Barly and Devigne. Blanchard has rendered an essential service to aeronauts by the invention of the parachute, which they can use, in case of necessity, to let themselves down without danger.

The arrangement of the parachute, with reference to its use for aeronautic purposes, may now be more fully illustrated.

In the right hand figure, M. Garnerin's apparatus is seen as it ascended from St. George's parade. A cylindrical box, about three feet in height, and two in diameter, was attached by a straight pole to a truck or disc at the top, and from this was suspended a large sheet of linen, somewhat similar to an umbrella. The form it assumed on the descent of the aeronaut is shown in the next figure. When first cut from the balloon, it descended with amazing velocity, and those who witnessed its progress considered the destruction of the aeronaut as certain; but after a few seconds the canvas opened, and the resistance was so great, that the apparatus diminished in its speed, till on its arrival near the earth it was not greater than would have resulted from leaping a height of two feet.

Amongst the unfortunate aeronauts we may place Major Money, who ascended from Norwich, under the full impression that the aerial current would take the balloon in the direction of Ipswich. Scarcely, however, had he attained an altitude of one mile, when a violent hurricane, operating in a new direction, drove the balloon towards Yarmouth. Several small row boats immediately put out from that port, and endeavored to keep pace with the balloon, but without success; and Major Money first touched the sea about nine miles from land, and more than three from any means of assistance.

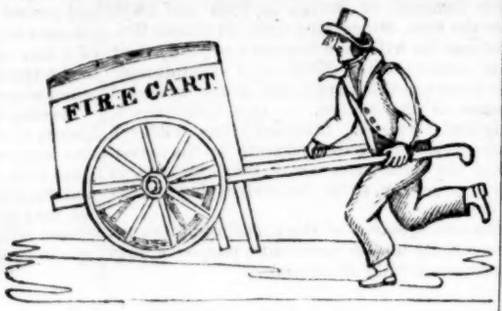


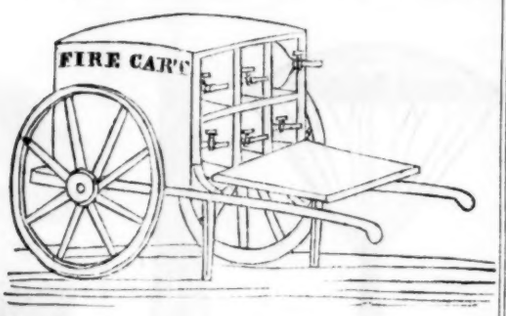
Our artist has delineated the situation of Major Money at the period we have now been describing, or rather about ten minutes after he had parted with a portion of his clothes and instruments; and it was only by the assistance of a fast sailing cutter, which happened to lay in the track of the balloon, that he was saved, when almost exhausted.

Having thus given a brief account of the early history of the aerostatic art, and of the successive improvements which the balloon has undergone both in its external form and appearance, and the nature of the material used for inflation, we may now speak of the very beautiful machines which are employed for aerial excursions by the aeronauts of the present day.

The preceding illustration exhibits a very picturesque view of the ascent of that veteran, Mr. Green, from the Park, on the occasion of the coronation of his late majesty, George IV. The balloon itself, the form of which is similar to, but infinitely more beautiful than, a pear, is composed of strips of variegated silk, the harmony of which has a particularly pleasing effect on the eye. Over this is thrown an envelope of net-work, which passing down serves as a support to which the car is attached.

The utility of aeronautic studies and experiments has been very much questioned, even by philosophical minds. M. Cavallo, well known in the philosophical world, suggested long ago that small balloons, especially those made of paper, and raised by means of spirits of wine, may serve to explore the direction of the winds in the upper regions of the atmosphere, particularly when there is a calm below; and we see the French aeronauts adopted this idea, that they might serve also for signals in various circumstances, in which no other means can be used; and letters or other small things may be easily sent by them: for instance, from ships that cannot safely land on account of storms, from besieged places, islands, or the like. The larger aerostatic machine, he adds, may answer all the above-mentioned purposes in a better manner; and they may, besides, be used as a help to a person who wants to ascend a mountain or a precipice, or to cross a river; and, perhaps, one of the machines tied to a boat by a long rope, may be, in some cases, a better sort of sail than any that is used at present. Their conveying people from place to place with great swiftness, and without trouble, may be of essential use, even if the art of guiding them in a direction different from that of the wind should never be discovered. By means of these machines the shape of certain seas and lands may be better ascertained; men may ascend to the top of mountains they had never visited before; they may be carried over marshy and dangerous grounds; they may by that means come out of a besieged place, or an island; they may, in hot climates, ascend to a cold region of the atmosphere, either to refresh themselves, or to observe the ice which is never seen below; and, in short, they may be thus taken to several places, to which human art hitherto knew of no conveyance.





A Plan for the Speedy Extinction of Fires.

[From Captain Manby's Circular to Insurance Companies in England.]

It must be obvious that the ready extinction of fire depends entirely on the facility with which water is brought to act upon it at its commencement; and that, when left uncontrolled during the delay of engines arriving, the procurement of water, and the further delay of getting the engines into full action, it reaches a height at which its reduction is highly doubtful, and at least very difficult. Many instances of destruction by fire have been caused by obstructions to the conveyance of engines to the spot, or from the impossibility of procuring water to enable them to act when they have arrived; and in every case some delay necessarily takes place in preparing the engines, even when water is at hand. It is a well-known fact that many of the great and destructive fires in London and other large towns, where water-pipes are laid, might have been controlled if water could have been obtained in time. In towns not so provided, villages, the detached residences of gentlemen, and other buildings in the country, the want of water at hand, or other means of extinction, makes their total destruction in case of fire almost inevitable.

From observations which I have made in witnessing fires, and from information of those persons constantly employed on such occasions, I am assured that a small quantity of water, well directed and early applied, will accomplish what, probably, no quantity would effect at a later period. This has excited my attempts to provide some prompt and efficient means by which the anxious and often important interval of delay would be obviated, and the fire opposed on the first alarm, thereby not allowing the flames to increase in fury; which so often occurs, that the efforts of the fireman are exerted rather with the hope of preventing the extension of the calamity to other buildings, than to save that in which it first broke out.

To attain this object, I propose a Fire Cart of light construction, requiring but one person to convey it to the spot, and apply a fluid, in the most efficacious manner, from portable vessels or engines, on a principle very long known—the artificial fountain in pneumatics. The engines are to be kept always charged, and one when slung across the body of a watchman or servant is easily carried to any part of the building, however difficult of access. The management required is simple: for on opening the stop-cock, the pressure of condensed air instantly propels a stream that can be directed with the most exact precision on the part in combustion,—a circumstance extremely important, when the incipient fire is not within the reach of effort by the hand, and when the air, heated by the flames, prevents approach to cast water upon it by common means.

Every fire, even the greatest, must arise from small beginnings, and when discovered in its infant and commencing state, is easily to be kept down and prevented from becoming destructive, if means of early application were at hand. We often hear of the alarm of fire given by watchmen long before the arrival of engines on the spot, and, if they were provided with a fire cart, the alarm of the watch and application of means of extinction would be simultaneous.

The cart contains six engines, each charged with the impregnated solution of an ingredient best adapted to extinguish fire. When the first engine has expended its store of antiphlogistic fluid, a supply of others in succession may keep up a constant discharge until regular engines and plenty of assistance arrive, should the fire not be entirely subdued by these first efforts.

When a small quantity of simple water is cast on materials in a state of violent combustion it evaporates into steam from the heat, and the materials thus extinguished readily ignite again; the addition of incombustible ingredients consequently becomes necessary to make quality supply the place of quantity, and thus with the smallest portion prevent the fire rekindling.

To give the most extinguishing properties to common water has engaged the experimental attention of many in different countries,* and it has been rendered by them more effective to extinguish fire than forty times the same quantity of common water (a circumstance not speculative, but conformed by trial made upon buildings erected for that purpose); but the simple ingredient of pearl-ash dissolved in water when applied on burning substances, forming an incrustation over the surface extinguished, and thereby preventing the access, has in my estimation a decided preference; it has likewise the superior recommendation of the readiness with which any person may imbue the water with it, while the compounds cannot be had but at considerable cost, nor be prepared without labor and nice accuracy in their respective proportions. Thus at the moderate ratio of twenty times increasing the quality, the cart would convey an extinguishing fluid equal to one tun and a half of common water.

Specification in reference to the Apparatus belonging to the Fire Cart.—Each machine is a strong copper vessel, of a cylindrical form, two feet in length and eight inches in diameter, capable of containing four gallons; a tube of the same metal, of one-fourth of an inch in diameter, curved so that its end is carried to the side of the vessel, with a stop-cock and jet-pipe, the vent of which is one-eighth of an inch in diameter at its top, reaches to within half an inch of the bottom, and is to be screwed so closely into the neck of the vessel as to preclude the possibility of the escape of the air.

Three gallons of water, holding in solution any ingredients* best adapted to extinguish fire, are to be put into the vessel, and then the room remaining for the fourth gallon to be filled with closely condensed air; to effect which, the jet-pipe is to be unscrewed, the condensing-syringe fixed in its place, and the air to be pumped in, to the utmost power of the strength of the vessel to contain it; the stop-cock is then to be closed, condensing-syringe taken off, and the jet-pipe replaced.

On turning back the stop-cock, the condensed air re-acts on the water, and casts it to a height proportioned to the degree of condensation.

That the machine may be more easily carried, where access is difficult, it is put into a leathern case with a strap, and, slung over the shoulders of the bearer, is thus conveyed easily, and then directed with the utmost precision to the point requiring the water.

As directions for the effective arrangement of fire carts in populous places, the following plan I should propose: That at each watch-house, from the time of the watch setting, there should be in attendance a regular fireman instructed in the use and management of the apparatus; and that each parish should be provided with one or more fire carts, according to its extent or number of wards, and the vessels or engines composing the complement of the cart to be kept charged ready for being immediately applied. When watch-boxes or stations are at a considerable distance from the watch-house, some central watch-box should have a single engine lodged ready for application, to be brought on the alarm by the watchman, and delivered to the fireman, who repairs to the spot on the alarm of fire being given with as much expedition as possible. Should the fire have broke out near the depot of the fire cart, the fireman in attendance will take the cart with him, or an engine from it ready to apply; if otherwise, the watchmen will each bring an engine, which the fireman will expend, and by receiving from others their engines, a regularly-continued and well-directed stream will be kept up, which, from the early opposition to the fire, will no doubt check the flames, if not entirely subdue the fire; should the distance be considerable, the fireman, aided by a watchman, would convey the cart to a place on fire with as much dispatch as possible.

* 1734. M. Fuches, a German physician, by throwing balls into the fire, containing certain preparations, which burst with violence, instantly quenched the fire.

1761. Zachary Grey used the same process, in which were alum, sal ammoniac, and other saline matters, with water.

In the same year Dr. Godfrey, in a public exhibition in a house erected for that purpose near Mary-le-bone, applied the like ingredients with great success, by the action of confined gunpowder only, which, exploding, dispersed the solution on the materials in combustion, and effectively extinguished the same.

1792. M. Von Ahen, at Stockholm, made numerous public experiments to show the effects of several combined ingredients to render materials entirely incombustible; he is stated to have subdued an artificial fire by two men and forty measures of preparation, that would have required twenty men and fifteen hundred of the same measures of simple water.

In the same year, M. Nil Moshein made many public exhibitions to confirm that combustible materials might be made perfectly incombustible; as also did Mr. W. Knox, of Gottenburg.

* Pearl-ash, dissolved in water, when applied on burning substances, forms an incrustation over the surface extinguished, and prevents that part from reinflaming.

CEMENT FOR GLASS OR CHINA.—An ounce of pure gum mastic is to be dissolved in q. s. of well rectified alcohol, and the same quantity of ichthyocolla steeped in water till soft, and then

dissolved in alcohol; these solutions are to be mixed, and a quarter of an ounce of gum ammoniac added. The whole is now to be exposed to a gentle heat till perfectly amalgamated, when it is to be poured into a vial and kept well corked. When it is to be used, both the vial and the vessel to be mended are to be warmed, and the united fragments should be pressed in close contact for at least twelve hours.—[Journ. des Connais. Usuel.]

On the Composition of Organized Structures, Similarity of Charcoal to the Diamond, &c. Selected for the Mechanics' Magazine, from Donovan's Chemistry.

Notwithstanding the perplexing diversity of form which vegetable substances assume, experiments have proved that they are all composed of the same ultimate materials, and these very few in number. We may select any vegetable structure as the representative of all the rest; and, by examining others in the same manner, it will be found that they present the same results. The method by which the component elements are separated is simple; the vegetable is merely exposed to the action of fire: not an open fire, for in this way all its parts would be dissipated or burned away; but in a vessel calculated to retain its principles in such a manner as to permit their being brought under examination. Green wood will be a good instance. Take a common gun barrel, the touch-hole of which is stopped; push a small cylinder of green wood down to the breech, and place that end horizontally in a good coal fire. As the wood is heated, the water, which is the chief ingredient of its juices, distils over, and drops from the open end of tube. In proportion as the water distils, from being insipid, it becomes sour. Shortly after, a gas issues out of the tube, and may be collected by tying a moist bladder, the common air being well pressed out of it, round the mouth of the tube. If, when the gas ceases to issue, the contents of the tube be examined, the piece of wood will be found altered into a black, dry, light, sonorous mass, retaining, however, its texture, though much reduced in size. It is, in short, converted into charcoal, or, in chemical language, carbon; and, if its weight be added to that of the gas, the mere water, and the sour water, the result will be the original weight of the wood without loss; hence these are all the ingredients which composed the wood. As a general summing up, we may recapitulate, that from wood we obtain hydrogen, carburetted hydrogen, bicarburetted hydrogen, carbonic oxide, carbonic acid, ascetic acid, holding tar, ammonia, and charcoal. By multiplying experiments on other vegetable structures, we learn, that all of them, however complicated when made to undergo the ordeal of heat in confined vessels, resolve themselves, like wood, into the four elements, oxygen, hydrogen, carbon, and azote; the latter being in such small quantity as to be barely discoverable. These, again, by combining amongst themselves, produce the compounds above described, but the four ingredients mentioned are what are called the ultimate elements of all vegetable matter, notwithstanding its apparent diversity. A striking proof of the extraordinary differences of appearance which the same body may assume, and also of the intrinsic worthlessness of some of those objects on which society sets the highest value, occurs in the instance of the substance under consideration. Every one knows the enormous price at which diamonds of good quality and size are estimated. The celebrated regent diamond, which was set in the handle of the late Emperor Napoleon's sword of state, is now valued at £260,000, although only 1½ ounce, and was originally purchased for £20,400 by Thomas Pitt, grandfather of the great Earl of Chatham, while Governor of Madras. Yet this precious ornament is neither more nor less than a piece of charcoal; and, surprising as it may appear to those hitherto unacquainted with the fact, it is well proved by numerous experiments, that between the diamond and charcoal there is almost no difference of composition; the diamond burns in oxygen with brilliant flame, and, like charcoal, forms carbonic acid; like charcoal, it forms steel by combination with iron; and the difference between the two bodies seems to be chiefly in their state of aggregation, the diamond being harder and crystallized; it is also a little purer in composition. The pure portion of charcoal is distinguished among chemists by the name of carbon.

Having acquired some acquaintance with the vast variety of form under which the objects constituting the vegetable world appear and the simplicity of their composition, the next subject of contemplation is the animated part of the creation,—the most interesting and stupendous of all. How much more admirable and surprising must the structure of a living animal appear, when it is known that it is composed of but a few elements, such as have been formerly described: little more than the meanest vegetable, and fewer than many minerals. The materials of which animals are composed being nearly the same, as those which compose plants, the difference is in their relative quantity, and in the mode of combination. The combustible substance, phosphorus, has been detected, in small quantity, in some vegetables, as in the onion; but it exists in large quantities in the bones of animals: not in the state of phosphorus, as commonly seen, but disguised by combination with oxygen in the state of an acid, and this acid combined with lime. The bones of animals, then, consist chiefly of lime and phosphoric acid; at least these ingredients compose their earthly basis, as it is called; but it is impregnated with animal matter that adds greatly to their strength, toughness, and solidity. The other element which exists largely in animal matter is azote: it is also a constituent part of several kinds of vegetable matter; and it is singular, that the same azote, which adds so much to the nutritiousness and flavor of animal food, renders vegetable matter disgusting to the taste, and poisonous. The chief substances, then, which enter largely into animal matter, are oxygen, hydrogen, azote, carbon, phosphorus, and lime. We find some other kinds of matter, as certain acids and metals, but in quantity so small as not to affect the truth of the above statement, that the foregoing six ingredients constitute the great bulk of the animal fabric.

Chemical Amusements.—*Sympathetic Ink.*—Write with a diluted solution of muriate of copper, and the writing will be invisible when cold; but when held to the fire it will appear of a yellow color.

2. Write with a diluted solution of muriate or nitrate of cobalt, and the writing will be invisible; but, upon being held to the fire, it will appear perfectly distinct, and of a blue color; if the cobalt should be adulterated with iron, the writing will appear of a green color; when taken from the fire, the writing will again disappear. If a landscape be drawn and all finished with common colors, except the leaves of the trees, the grass and the sky, and the latter be finished with this sympathetic ink, and the two former with the adulterated solution just mentioned, the drawing will seem to be unfinished, and have a wintry appearance; but upon being held to the fire, the grass and the trees will become green, the sky blue, and the whole assume a rich and beautiful appearance.

This landscape will, at any time, exhibit the same appearance.—[Delaware Free Press.]

Spontaneous Combustion.—That animal bodies are liable to internal combustion is a fact which was well known to the ancients. Many cases which have been adduced as examples of spontaneous combustion are merely cases of individuals who were highly susceptible of strong electrical excitation. In one of these cases, however, Peter Bovisteau asserts that the sparks of fire thus produced reduced to ashes the hair of a young man; and John de Viana informs us, that the wife of Doctor Friellas, physician to the Cardinal de Royas, Archbishop of Toledo, emitted by perspiration an inflammable matter of such a nature that, when the ribbon she wore over her shift was taken from her, and exposed to the cold air, it instantly took fire and shot forth like grains of gunpowder. Peter Borelli has recorded a fact of the very same kind respecting a peasant whose linen took fire, whether it was laid up in a box when wet or hanging in the open air. The same author speaks of a woman who, when at the point of death, vomited flames, and Thomas Bartholia mentions this phenomenon, as having often happened to persons who were *great drinkers of wine and brandy*. Ezekiel de Castro mentions the singular case of Alexandrinus Megeteus, a physician, from one of whose vertebrals there issued a fire which scorched the eyes of the beholders, and Kantius relates, that during the wars of Godfrey of Bologne, certain people of the territory of Nivers were burning with invisible fire, and that some of them cut off a foot or a hand where the burning began in order to arrest the calamity.—[D. Brewster's Letters on Natural Magic.]

To Cure Butter.—Beat up and blend well together two parts of best common salt, one part of brown sugar and one of saltpetre. One ounce of this preparation is well worked into every pound of butter, which is then to be put up for use, in a close vessel.

Butter thus cured will appear rich and marrowy, and will have a fine color, and never acquires a brittle hardness nor tastes salt. It will keep good for three years, only observe that it must stand some 3 or 4 weeks after put up before used.—[N. E. Farmer.]

Paper Carpets.—Paper carpets are formed by cutting out and sewing together pieces of linen, cotton, Scotch gauze, canvass, or any similar material, &c., to the size and form required; then stretching the prepared cloth on the floor of a large room, and carefully pasting it round the margins so as to keep it strained right. If cotton be the material, it will require to be previously wetted. When the cloth thus fixed is dry, lay on it two or more coats of strong paper, breaking joint, and finish with colored or hanging paper, according to fancy. Centre or corner pieces, cut out of remnants of papers, which may be bought for a mere trifle, may be laid on the self-colored ground, and the whole surrounded by a border; or any other method adopted which may suit the taste or circumstances of the occupier, or accord with the other furniture of the room. When the carpet is thus prepared, and quite dry, it should receive two coats of glue, or size made from the shreds of skins, such as is used by carvers and gilders. This size should be put on as warm as possible, and care should be taken that no part of the carpet should be left untouched by it, otherwise the varnish to be afterwards laid on will sink into the paper and spoil it. When the size is perfectly dry, the carpet should have one or more coats of boiled oil; and when that is dry, a coat of copal or any other varnish. The varnish is not absolutely essential, as boiled oil has been found to answer very well without it: but where oil only is used, it requires several more coats to be applied, and takes a much longer time to dry. These carpets are portable, and will roll up with about the same ease as oil cloth. They are very durable, are easily cleaned, and, if made of well chosen patterns, have a very handsome appearance.—[Encyclopædia of Cottage, &c., Architecture.]

[*From the American Railroad Journal.*]

We are indebted to CHARLES H. HAMMOND, Esq. of Bennington, Vt., for the interesting and valuable letter from J. LOUDON M'ADAM, Esq. of Hertfordshire, England, upon the subject of road making, which will be found in this number of the Journal. It will, we are sure, without any solicitation on our part, be read with great pleasure by all who take an interest in the improvement of our system of road making, emanating as it does from a gentleman of intelligence, and long experience in the business upon which he writes.

HODDESDON, HERTFORDSHIRE, (Eng.)
November 14th, 1833.

C. H. HAMMOND, Esq. Bennington, Vt.

Sir,—In the Railroad Journal of New-York, of 21st March last, Vol. 1, No. 13, I saw a copy of a letter from you to the Hon. George Tibbets, by which I am glad to see that the science of road making has attracted notice in America, and I am flattered by your approbation of the system which I have ventured to recommend to my country.

As an acknowledgment of my obligation to you for your favorable opinion, I take the liberty of explaining to you the difficulty, I had almost said the impossibility, of transmitting a proper and effectual knowledge of road making by writing, so as to convey such a body of information as will enable a person to act upon it in every case and on every emergency that occurs; and unless the party directing be possessed of this knowledge, he will be constantly in danger of misdirecting in some seemingly trivial matter that deranges the works and defeats the object contemplated. However well his theory may be based on true principles, a practical man must also know, intimately, the value of every species of service to be performed by workmen, as compared with the value of labor in the country; it is in vain to expect economy to be obtained in road making, unless the whole work be done by the laborers by piecework. Whenever day labor is the system, extravagant expenditures and boundless profusion will be the consequence.

The sub-surveyor, whose duty it is to be constantly present where the work is proceeding, ought to be able to fix the price of work by weight or measurement, and to make fair and equitable bargains with the workmen, by which they may be enabled to earn the reasonable wages of the country, using a proper degree of industry; and the sub-surveyor ought to be a very good judge of the quality of the work, so as to insure to the public the proper value as well as quantity of labor for the money.

The sub-surveyor must have a perfect knowledge of what work is necessary to be done, and the manner and cost of its performance; he must be able to give to new and unpracticed workmen such instructions, and to supply them with such tools, as may enable them, with due industry, to earn fair wages at reasonable prices.

He must also have good practical experience in draining a road; difficult as it may be to explain the other branches of road making, this it is impossible to describe or to teach by any other process than experience, under a skilful person; the shape of the country, the section of the road, its situation in respect to the adjacent grounds, the nature of the soil, and many minor considerations, vary so often in every part of the same road and country, that the practice can be described and defined by no fixed rules or instructions. If the sub-surveyor be not a practically skilled drainer, the road he has the charge of will neither be good, durable, or preserved economically, unless his superior officer, the general surveyor, takes on himself this duty of directing the operation, which I and my family have been frequently obliged to do.

Our plan of distributing piece-work among the workmen is to employ them in gangs, never exceeding five men, one of whom, selected by themselves, is called the gangman, and with him the bargain is made by the sub-surveyor for pieces of work sufficient to employ the gang about a week, as no great loss or damage can happen in that time and on that quantity; if the gang do the work well, and earn fair wages by industry, they get another bargain; if idle, or disposed to slight the work, they are not again employed, by which means a road is in a short time supplied with good and expert workmen.

When the improvement of roads commenced in England in 1815, the cost of repairing the Bristol roads (178 miles) was about £19,000 annually, the roads then in such a condition as to be almost all under notice of indictment—at present the annual cost for repairs is about £13,000, including salaries for management.

I took the charge as general surveyor of the British roads in 1815, and was obliged to instruct all the sub-surveyors, (nine in number;) they again instructed others, by which process we obtained, after a few years, some skilful surveyors. We have found, experimentally, that from one to two years are necessary for instructing a sub-surveyor, according to his diligence and ability; and even when instructed, it is prudent to place him for some time near a more experienced surveyor, or more immediately under the inspection of the general superintendent.

The system followed by my family and myself is to take charge, as general surveyors, of a number of district of roads, or, as called in England, trusts; upon these we keep one or more surveyors, according to the number of miles and the work in each trust. We employ at present under my sons, grandsons, and myself, about a hundred sub-surveyors, and have in charge a considerable number of roads both in England and Scotland; but our system is by no means universal: many sets of trustees are attached to old surveyors, many to old practices. Economy and improvement have yet a great field to conquer in Britain—in your recent country you have fewer obstacles to encounter.

The importance of skilful and respectable superintendence in the officers of roads is ill understood in this country—deep-rooted abuses, old prejudices, and some great defects in our system of road law as to contract, have all contributed to prevent the whole benefit we might derive from good roads at a moderate cost, notwithstanding the experience of eighteen years.

I am not acquainted with the laws and regulations under which the roads in the United States are managed; perhaps their care depends upon the Legislature of each individual State, perhaps upon a still smaller subdivision of authority, whereby it may be difficult to make an exertion for attainment of the practical science necessary for the general interest; but if such an exertion could be made on an efficient scale, I am persuaded it would be of infinite benefit in producing immediately, at a reasonable expense, serviceable roads which could be upheld at a cheap rate. It would also prevent the introduction of improper plans of road work, which are frequently found difficult to be eradicated.

Should it be practicable to induce one or all of the States to attempt the introduction of a regular uniform system of road work and road management, on the most approved and economical plan, it would be necessary to send some persons to this country to serve an apprenticeship of not less than a year. Both classes of surveyors and sub-surveyors require the necessary practical information; their duties are distinct, although pointing to one object; their station in society ought also to be distinct.

The general surveyor should be a well informed young gentleman, entering into life with a value for character, and having connections and a station that would place him beyond the reach of suspicion himself, and give him he consequence and authority so absolutely necessary for the due discharge of his duty in defending the interest of the public, in addition to all the detail of the duties of a sub-surveyor, in which he ought to be thoroughly informed; he must be an expert accountant, so as to be able to keep an effectual and steady control over the weekly accounts of the sub-surveyors; compare the work done with the money paid, with such skill as to preclude the possibility of extensive imposition proceeding for any length of time undiscovered. This service can only be performed effectually by a gentleman perfectly qualified; and the sub-surveyors feeling themselves under the orders of an efficient officer, are attentive and careful in their conduct, but very soon throw off their circumspection when only under the authority of trustees, who occasionally, superficially and unskilfully, look into their accounts, and are quite unequal to the necessary task of comparing the extent and quality of the work done with the money expended, or of giving a little direction to the work when they find it defective.

Sub-surveyors should be selected from the class of yeomen in England—in America of respectable farmers: their early acquaintance with agricultural management has been found useful. The duty of the sub-surveyor is ministerial; he is to take the orders of trustees through the general surveyor, and to possess the skill and experience requisite to have the work performed in a proper manner, and at a fair price; to be able to measure work correctly, and to settle with the laborers. His knowledge of figures should be such as to enable him to keep an intelligible account, to fill up correctly the form of the weekly account which he will be furnished with, and to deliver it, in duplicate, every fortnight, to the general surveyor: one copy to be delivered to the treasurer, the other to remain as a record with the general surveyor, at all times open to the inspection of trustees and others intrusted.

Experience during eighteen years practice has instructed us in many particulars that appear trivial, but which we find to be very important in making a road solid, impervious to water, smooth in the surface so as to be easily travelled upon, and consequently kept in repair at a reasonable expense. Some theoretic opinions, at first adopted, have been corrected—others given up as erroneous; the science of road making is still capable of improvement for the benefit of mankind.

Your magnificent river, canal, and railroad conveyances, will not supersede common roads; those great works promote industry, wealth, and population. Communications must be multiplied to answer the increased demands of commerce, and connect those important works. America will require a number of stoned roads in proportion to the extension of her other great improvements; and it will in the end be greatly conducive to economy and good effect, if, at once, the states should take decided measures to have a certain number of persons practically instructed, which is the only instruction that will ever be found effectual.

Having resided fourteen years in America, and having seen the effect of severe frost and sudden thaws on roads, I am quite safe in assuring you that more skill and care in the construction of roads are required in America than in England.

I have read in the Railroad Journal of New-York, of 18th August, 1832, Vol. 1, No. 34, a kind of controversy, about a road called the Third Avenue: if that road be constructed as described by one of the disputants, I must say that there has been much labor and expense bestowed in giving the road every possible chance of being rough in the surface, and consequently inconvenient for carriages, and also providing abundantly for the mischievous effect of frost, by securing a lake of water under it, and the consequence of its erroneous formation will be great unnecessary expense.

In case of the adoption of any measures for sending persons from the United States to this country for instruction, they should be carefully selected from those who have had no opportunities of imbibing previous notions, or imagining that they have any knowledge of the work they are sent to learn.

I have the honor to be, sir, your most obedient servant, JNO. LOUDON M'ADAM.

On the Human Eye—Description of its Structure, &c. [From Dr. Arnott's Elements of Physics.]

The *human eye* is a globular chamber of the size of a large walnut, formed externally by a very tough membrane called, from its hardness, the *sclerotic coat*, in the front of which there is one round opening or window, named, because of its horny texture, the *cornea*. The chamber is lined with a finer membrane or web—the *choroid*, which, to ensure the internal darkness of the place, is covered with a black paint, the *pigmentum nigrum*. This lining at the edge of the round window is bordered by a folded drapery—the *ciliary processes*, hidden from without by being behind the curious contractile window curtain, the *iris*, through the central opening of which, or *pupil*, the light enters. Immediately behind the pupil is suspended by attachments among the ciliary processes, the *crystalline lens*, a double convex most transparent body of considerable hardness, which so influences the light passing through it from external objects as to form most perfect images of these objects in the way already described, on the back wall of the eye, over which the optic nerve, then called the *retina*, is spread as a second lining. The eye is maintained in its globular condition by a watery liquid, which distends its external coverings, and which in the compartment before the lens, or *the anterior chamber of the eye*, being perfectly limpid, is called the *aqueous humor*, and in the remainder or larger *posterior chamber*, being inclosed in a transparent spongy structure, so as to acquire somewhat of the appearance of melted glass, is called the *vitreous humor*.

The annexed figure represents an eye of the common dimensions, supposed to be cut

through the middle downwards. C is the outer or *sclerotic coat*, known popularly, where most exposed in front, as the *white of the eye*. A is the transparent cornea joined to the edge of the round opening of the sclerotic: it is more bulging than the sclerotic, or forms a portion of a smaller sphere than the general eye-ball, so that while it may be truly called a *bow window*, it, or rather the convex surface of its contained water, is also a powerful lens for acting on the pencils of entering light. At B, and similarly all around the edge of the cornea, is attached the window curtain or *iris*, shown here edgeways, immersed in the aqueous humor, and hanging inwards from above and below towards its central opening or *pupil*, through which the rays of light are passing to the lens. The iris has in its structure two sets of fibres, the circular and the radiating, which cross and act in opposition to each other. When the circular fibres contract, the pupil is lessened; when the radiating contract, it is enlarged: and the changes happen according to the intensity of light and the state of sensibility of the retina,—as may at any time be proved by closing the eye-lids for a moment to make the pupil dilate, and then opening them towards a strong light, to make it contract. Behind the pupil is seen the *lens* D with its circumference attached to the *ciliary processes* E: it is more convex behind than before. The disease of the eye, called *cataract*, (from a Greek word implying *obstruction*,) is the circumstance of the lens becoming opaque, and the cure is to extract the lens entirely, or to depress it to the bottom of the eye, and then to substitute for it externally a powerful artificial lens or spectacle-glass. The three lines, forming here the boundary of the eye, stand for its three coats, as they have been called, the strong *sclerotic*, and the double lining of the *choroid* and *retina*. The figure of a cross is represented upon the retina as formed by the light entering from the cross without, which cross has to appear here small and near, although supposed to be large and distant. The image of the cross is inverted, as explained for the camera obscura: but we shall learn below that the perception of an object may be equally distinct in whatever position the image be on the retina. It has been explained above, that a lens can form a perfect image of considerable extent only on a concave surface, and the retina is such a surface. The present diagram farther explains what is meant by the *anterior* and *posterior chambers* of the eye, viz. the compartments which are before and behind the crystalline lens D.

The nature of the eye as a camera obscura is beautifully exhibited by taking the eye of a recently killed bullock, and after carefully cutting away or thinning the outer coat of it behind, by going with it to a dark place and directing the pupil towards any brightly illuminated objects; then, through the semi-transparent retina left at the back of the eye, may be seen a minute but perfect picture of all such objects—a picture, therefore, formed on the back of the little apartment or camera obscura, by the agency of the convex cornea and lens in front.

Understanding from all this, that when a man is engaged in what is called looking at an object, his mind is in truth only taking cognizance of the picture or impression made on his retina, it excites admiration in us to think of the exquisite delicacy of texture and of sensibility which the retina must possess, that there may be the perfect perception which really occurs of even the separate parts of the minute images there formed. A whole printed sheet of newspaper, for instance, may be represented on the retina on less surface than that of a finger nail, and yet, not only shall every word and letter be separately perceivable, but even any imperfection of a single letter. Or, more wonderful still, when at night an eye is turned up to the blue vault of heaven, there is pourtrayed on the little concave of the retina the boundless concave of the sky, with every object in its just proportions. There a moon in beautiful miniature may be sailing among her white edged clouds, and surrounded by a thousand twinkling stars, so that to an animalcule supposed to be within and near the pupil, the retina might appear another starry firmament with all its glory. If the images in the human eye be thus minute, what must they be in the little eye of a canary bird, or of another animal smaller still! How wonderful are the works of Nature!

[*From the Daily Troy Press.*]

Wear of Roads.—Improvements in the form and motion of wheel carriages have been very great for the last quarter of a century. In these particulars this branch of the arts has kept pace with other improvements of the age: but in the important particular of *diminishing* draft, and the *friction* and *wear* that carriage wheels occasion to the surface of roads, but little has been done—no more, in short, than what is caused by a combination of greater strength, with less actual weight, of material. Some improvement is doubtless attributable to the introduction of the metallic pipe box, in lessening friction at the *hub*; but after all, it may be questioned, whether in the aggregate the alterations that have been made in the construction of the axle and wheel in modern carriages have not rather *increased* than *diminished* the *wear of roads*.

Our objections lie against the *form* of the wheel and axle. There is no friction except at the centre and circumference of the wheel which affects the draft—the latter only affects the road.

It is a well understood principle in mechanics, that the friction of any part of a machine is increased by loading that part with superfluous work or contrivance. Let us apply this principle to the wheels in use. It is expected of a carriage wheel that it should traverse a line in the direction of the draft, and that it should sustain at its fulcrum the load imposed upon it. These two are the only legitimate offices of a carriage wheel; these are all that are attained, and all that, with an eye to utility, can be required. All work, therefore, bestowed upon a wheel, for other purposes except for strength, beauty or finish, is superfluous.

To cause a wheel to traverse a line in the direction of the draft, and to sustain at its fulcrum the load imposed upon it, and that too with the least possible friction to its own surfaces, and the *surface of the road it traverses*, is the end desired. To obtain it, the wheel and axle should be so constructed as to occasion no other pressure at the axle, or at the fulcrum, than a *vertical* one, and no other bearing by the wheel *on the road* than a vertical one—lateral pressure, and all pressure except in a perpendicular direction, is objectionable.

The reader cannot have failed to observe that in ordinary stage or waggon wheels that part of the axle which is inserted in the hub is *bent downwards* so as to incline the wheel *from* the body of the carriage, and hence it is apparent, that, in addition to the *vertical*, there is a *lateral* pressure also. The *nave* of the wheel must impinge upon the shoulder of the axle. This occasions friction at the *nave*, but it is very inconsiderable when compared with the friction thus produced at the circumference of the wheel and on the surface of the road.

A wheel so constructed as to stand in a position *not* perpendicular, but *inclined* to the horizon, will, when set in motion, (if not prevented) describe a curve. This perhaps has occurred in the experience of all. Take a wheel, set it in motion by hand, as long as it retains a perfectly vertical position, so long it traverses a straight line in the direction propelled; but as soon as it begins to incline to the plane on which it moves, it describes a curve.

In short, the operation of a wheel in motion on an axis which inclines it to the right or left must be similar to the revolution of a *cone*. If the small end of a cone is made to describe as long a line, or the same distance in every revolution as the large end, it can only be done by slipping or *grinding* along over the plane on which it moves. Similar, therefore, must be the operation of the wheels of a modern built carriage, each of which inclines from a true vertical position and sustains a pressure of 10 or 1200 lbs. The wheels, by their position on the axle, tend to move off in *curve* lines, and yet are compelled to traverse *straight* lines, which are tangents to their line of inclination—in other words, the line of direction which the wheels from their construction *tend* to run in, and the draft, are *at variance*, and the effect produced is, that much of the propelling power is lost or *wasted* in overcoming the tendency of the wheels to diverge from a straight line, besides a most injurious or grinding friction on the surface of the road. And this effect will be more or less embarrassing according to the *width* of the *tire*, but with either narrow or wide tire, it is plain that the friction must be immense. It is hardly matter of wonder therefore that even stone roads become pulverized and rutted, or that pavements are so frequently displaced and torn up.

The remedy for these evils will be a subject of remark hereafter. Veritas.

Railroad.—It may be gratifying to distant stockholders to be informed that the Saratoga and Schenectady Railroad has experienced no serious injury from the frost of the past winter. Some of the embankments will require slight repairs, growing out of their freshness; but as soon as they shall become solid, we know of no reason why they should not remain so. Indeed, every appearance indicates that the annual repairs of the road will be unimportant, and much less than has been generally anticipated. —[Saratoga Sentinel.]

[*From the Mechanics' Magazine and Register of Inventions and Improvements.*]

On Dry-Rot—its Causes, &c. By ROBERT MUDIE, author of "Modern Athens," "The British Naturalist," "Attic Fragments," and many other works of utility published in England.

"Well, what is this dry-rot? '*Xylostroma giganteum*, which grows in the timber like a thick, broad patch of dull yellow leather, or *serpula distruens* in other instances, which is smaller, redder in the color, and whitish at the edge, but that last is as often found upon other timber as upon oak.' Well, that is not a point worthy of much dispute; the timber is destroyed, and, generally speaking, these (the *Xylostroma* and *serpula*) are fungi: but it is just about as sensible to call these fungi 'dry-rot' as it would be to call flowing blood 'a wound,' or the worms that consume the body 'death!' Why come the fungi there? There was a time when dry-rot was unknown; and as long as the beams of houses were of good oak, or chesnut, or red pine from the north of Europe, there was no information laid against serpula. Besides, there never appeared a single fungus of any species upon or near the piece of oak in the experiment, and yet it passed from what may be regarded as the best state that it could be in for duration, to absolute uselessness, in so short a time that, if a ship were to decay as fast, the whole freight that could be obtained would not pay for the trenails. How is the same dry-rot to be got rid of? 'Oh, wash the timbers with sulphate of iron, and other saline solutions, and let the ship, or the house, as it may be, be well ventilated.' The old story—'Call in the doctor, apply a lotion, and exhibit a bolus,' under which the diseased have continued to die ever since medicine was a science. Are ships kept less clean now than they were before the dry-rot was heard of? or are they or houses worse ventilated? Truly not. If there be any difference, the ships must be kept sweeter, else the chlorides, and other powerful fumigations, have been invented and applied to little purpose. The crews certainly keep their health better than they did formerly; and it would be somewhat wonderful, if air, which were more wholesome for human beings, should be more deadly for oak timber! As for the houses again: there are certainly more under-ground apartments than there were once, and possibly more than it is wise to have. It may happen, too, that the tax upon windows has impaired the ventilation by those apertures; but in many of the modern houses, and those especially where the rot appears, the loss of ventilation by windows has been more than made up in ventilation by walls, many of which are so thin, and of materials so infirm, that, in as far as air is concerned, the fabric is ventilator all over."

"But fungi, by what names soever they may be called, are not locomotive destroyers; they do not, full grown, career over the land and the waters, to prey upon sound timber, as hawks do to prey upon birds, or wolves to prey upon sheep. The *sporæ*, or whatever else the small and generally invisible germs of the fungus may be called, are perfectly passive, and of themselves can do no more harm to an oak beam than could be done by a mustard-seed. The soil, in which alone it can germinate, or *begin* its action, is rotted wood. If it meet with that it will germinate; if not, it will remain inactive. There is no doubt that the increasing quantity of rotted timber has increased the number of those plants; but that has in no way altered the law of their nature, which is to grow in rotten wood, but not in wood which is sound. The only rational view of the case, therefore, is that the timber must be rotten before the fungus can act even in the slightest degree; and that, consequently, the fungus is produced by the rot, and not the rot by the fungus; and though the fungus is destroyed, the rot will go on probably as fast as if the fungus were not there; only, as the fungus has a great attraction for moisture, and as moisture, though not the cause, is an instrument in producing the rot, the fungus may, when it appears, hasten the destruction."

"Imported oak has been blamed for this decay; and it is true that the imported oak, and more especially the oak imported from America, is inferior to the oak which *once* grew in the forests of England. But the deterioration is not confined to the imported oak; and however bad that may be, it could not inoculate the oaks of the forest with its deleterious qualities any more than the species of insect called American blight, which infests apple trees, could take its departure for Hereford or Devon immediately on the landing of a cargo of American apples at Liverpool. The rot is in the timber itself—*that* is of an inferior quality; and the cause why it has been allowed to degenerate is, that they by whom oak trees have been bred have not been careful in the observation of nature, but have proceeded in their operations by means that had no natural foundation. The object of the grower has been to get goodly trees—trees that pleased the eye, without any regard to the quality of the timber; and the object of the nurseryman has been to rear up his seedlings and get them to market as soon and in as showy a condition as possible.

"It has been said that the wrong oak has been cultivated, and that may be true; for the very same circumstances which led to the wrong mode of treatment may have led to the using of the wrong plant. The collector of acorns would naturally proceed upon the joint principles of 'the most easily obtained and the most saleable.' I do not know that it is in all cases a positive fact, that the worst kinds of oak are the most prolific of acorns; but it is a sort of generally observed law among vegetables, that where there is a great deal of fruit, the wood is soft and perishable: and that has reason on its side. Trees do not work miracles any more than men do; and, therefore, if its action is more turned in any particular direction, it must be less in any other. Fruit trees are often killed *in the wood* by excessive bearing; and, therefore, it is natural to suppose that a similar excess must injure the wood of an oak. Now, it generally happens that, in the same species, whether in the same or in different varieties of the same species, the productions run largest when they are most numerous. Hence the acorns of the oak having the inferior timber are the most profitable for the gatherer, both to gather and to sell; and those two circumstances are quite sufficient to bring them to the market in preference to and even exclusive of the other—more especially as the purchaser is to grow seedlings, and not oak timber. The question of the timber is, indeed, a question seventy years hence with those who deal in acorns and seedling oaks, and as they have small chance of hearing any complaint that may be made about the quality, they of course give themselves very little concern about it.

"Now, if people have been able to cultivate animals into greater size and strength and beauty, and also to make them have better flesh and finer wool—if they have been able to improve by culture the beauty of flowers, and the nourishing qualities of all manner of esculent roots, stems, leaves, and fruits—it would be passing strange if their culture could do nothing for an oak tree, but make it more worthless timber. If all the earth were given to man for improvement, and he had improved much of it—as he actually has done—it would be a perfect anomaly, if timber, which is so very useful, should be the single article on which he could not lay his hand of culture without doing it an injury. It is impossible to believe that such an anomaly can exist in nature; and, therefore, the only way is to catechise the man who makes the attempt; and, if he does not understand what he is doing, send him back to nature to inform himself as to what he should do.

"There is a custom, and a very inveterate custom, which we have, and that is, the custom of generalising analogies. If there be a way in which one thing answers very well with us, we are apt to think that same way will do as well in all other things, even though the things are, in their nature, quite different. We go about to persuade ourselves that the way of doing one thing is the way of doing every thing, just as Lord Peter, in Swift's 'Tale of a Tub,' went about to persuade his two brothers, Martin and Jack, that the brown loaf was beef, and mutton, and venison, and custard; and as we are always very willing to believe ourselves, we are far more ready believers than Lord Peter's brothers.

"Now, in all our cultivations of vegetables, there is none, save that of timber trees, in which the quality of the wood is any consideration; and there is, perhaps, none of them in which the wood is not actually deteriorated by the culture. In the grain plants that is decidedly the case. Straw is very inferior to hay in strength, in flavor, and in every quality. The more highly, too, that the grain plant is cultivated, and the more abundantly it produces seeds—the grand object of the culture—the straw is always the worse. In the cold districts, where the crops of stunted oats are barely worth the gathering in, and would not be worth it at all in a place where labor is high, the straw is rich and sugary, whereas the straw of barley or wheat, grown upon land in high condition, is perfectly insipid. The former, too, is tough and firm, the latter soft and brittle, with little or no substance in it of any kind.

"It is the same with all the plants. One object is to obtain a certain part of the plant more abundantly and in higher perfection than it exists naturally, and we can obtain that only at the expense of the other parts. Compare a crab-stick with a similar portion of an apple tree, a hazle twig with one of filbert, a blackthorn with a plum, (if any or all of these be respectively the wild plant and the cultivated of the same species,) and see how inferior the wood of the cultivated tree is to that of the other. 'The wild wood' is just as superior in life as it is in strength. We have difficulty in keeping the cultivated plants 'rooted in,' and we have as much in getting the wild ones 'rooted out.' A very little observation of nature, and a few very simple reflections on that observation, might have shown us that that must have been the case; and had we taken that trouble, and very small trouble it is, we should never have gone about to cultivate timber in one plant by the process whereby we destroy timber in all other plants. Yet we have done, and we continue to do that; for, grafting excepted, we breed oaks and peaches in the same ground, and much after the same manner. We may make some difference in the mould in which they grow; or we may choose that which we fancy will be the best for each; but we do not even that as observers of nature, at least as very attentive or close observers; for our good soil for oak is that on which we have seen large oaks growing, whether the timber of those oaks happened to be good or bad."

Mr. Mudie then proceeds to inquire how nature proceeds in the production of one of the old "hundred year oaks":

"When the acorns are sown by nature, they are sown *on* the surface, not under it. The sprout tends downwards, as if to reach the ground, while the acorn lies on its side upon the surface; though even then the little tubercle which is to become the tree keeps its apex upwards. It is evident, therefore, that that part of the process is *naturally* done in the air; and, though seeds are better to have the light excluded during what may be called the 'fermentative' part of the process of germination, which is the earliest stage of it, yet, in the case of the acorn, that is over before the shell is ruptured.

"Now it is very much to be suspected that it is at this early stage that the mischief is done; and I am the more inclined to that opinion from the fact that the practical men seem to know very little about the process of germination, even in those seeds which they are sowing by thousands, nay, millions, every year—there is

not much, indeed, in the professed writers on Vegetable Physiology. The agency of light was not understood in the days of Grew and Malphigi; and though that agency be better understood now, there has not been *very much* added to the other branch of the science. Besides, the buried acorn does appear to make some sort of effort to come to the surface, and when it is there the cotyledons acquire a greenish tinge, which they do not acquire when buried; and that clearly shows that, in their *natural* state, they give to the food with which they supply the young plant some of that preparation which vegetable matter receives from the action of light. The condition of all blanched and etiolated plants, compared with that of the very same species freely exposed to the air, clearly shows that *carbon and astringency*, the very things in which the perishable oak timber is deficient, are among the principal results of the operation of light. These additions appear to hinder rather than to forward mere growth at the time—for an etiolated potatoe will rise thirty feet in the dark, whereas it would not rise so many inches if exposed to the light; but in the case of timber, there is a gain in consolidation, and that is the main point.

"The way in which the parts of the oak 'come' farther shows the importance of light to it at the very instant the plumule begins to move. By that time the root has penetrated to a considerable depth, and is furnished with absorbent rootlets. The nourishment which these procure cannot be acted on by the light in them, and the plumule, being just beginning to move, has no leaves, so that, if the cotyledons are buried in the earth, the oak must begin life with all the weakness of an etiolated plant; and if it begins without the carbon and astringency that are necessary for good oak timber, the timber of it must be bad, how long soever it may stand, or what size soever it may attain. Future treatment may make it grow faster or slower; but no future treatment can change the character with which it starts. If it starts good timber, it may be stunted or deformed, but it will be durable; and if it starts bad timber, it may be showy, but it can never be good."

"Want of the proper action of light at 'starting' is not the only injury which timber trees sustain, by the way in which they are grown for the market. They are sown so close, that while they remain in the seed-beds they want both air and light. A seed-bed of pines, in the early stage of their growth, resembles a plat of moss more than any thing else: and when it is considered that, in the situation where they are native, the pines stand singly and are exposed on all sides to the action of very keen air, it must easily be seen that they cannot acquire their due strength when huddled together to the number of many hundreds on a square foot. Those who are familiar with pine forests, or pine plantations, must be aware that the seeds of the cones never germinate under the thick shade of the trees, and grow up so as to form an underwood in the forest. Cones in abundance are produced every season, but they contribute chiefly to the food of the animal inhabitants, and it is only where a blank occurs, from the decay or the casual destruction of a tree, that young plants rise to fill it up. There are, indeed, few or no trees, of which the young plants grow and form underwood, while the old ones remain filling the air above; nor would it be in accordance with our general observation of nature, if they did. The young of no tribe, vegetable or animal, are the destroyers of the old; they merely come on, in succession, when they are required, and though the germs of all are exceedingly numerous, so that there never is room on a fit soil at the proper season without the plant appearing to fill it. But man comes in with his nursery-bed; and though he cannot be said to overstock the country (for there can hardly be too many trees—and there are numerous and wide wastes in England, where it is disgraceful that there are not millions,) yet the nursery-bed is overstocked, and the consequence is, the dry-rot in oak, and general rottenness and want of strength in all timber."

"The commercial advantages of having nurseries for forest trees, as well as other plants, near great towns, are so many and so much more obvious than the injuries that may thus be done to the trees, that many of them are in very tainted atmospheres. Ground there is high rented, and the plants are in consequence huddled together as closely as possible, both in the seed-beds and after they are transplanted. Still with the rich soil and skilful management in such places, the trees rush up quickly and look well, so that they are more 'taking to the eye,' and so fetch higher prices, than if they were to produce better timber. Indeed those plants, inferior as their timber must be, are actually the most acceptable to the immediate planter. Most species of forest trees are so long in coming to maturity, that the grand incentive to the planting of them is ornament and not use. Even the man who accumulates for posterity, in reality seldom does so in his own feelings of the matter; for he who leaves the most to others when he quits the world, did not collect it for them, but for himself—for the gratification of his desire of possession. The man who plants wishes to have something to look at, and to have it as speedily as possible, and that, with the other circumstances that have been noticed, conspires to cover the rich districts of the country with growing rubbish, which, when it comes to be cut down, is fit only for fire-wood, and very inferior for that."

THE HORTICULTURAL SOCIETY OF MARYLAND—for the Diffusion of Horticultural Science and the Improvement of the Art of Gardening; Associated Nov. 20—Incorporated by act of the Legislature, at December session, 1832.

The Council of this Association have resolved to open the public proceedings of the Society, by an exhibition of plants, flowers, fruits, and other vegetable productions.

The exhibition will be opened on the eleventh day of June next, and will continue during that and the following day.

On the eleventh of June, popular lectures will be given in the hall of exhibition, and on the twelfth the Society will hold a public meeting, when an address will be delivered.

In furtherance of the views of the Society, the Council have resolved to offer premiums to the aggregate amount of ONE HUNDRED DOLLARS, to be awarded to the finest objects exhibited, by a committee of judges appointed for that purpose.

The following gentlemen have been appointed to act as a committee of arrangement, viz; H. F. Dickehut, chairman; Z. Waters, George Fitzhugh, James Moore, Edward Kurtz, I. I. Hitchcock, Samuel Feast, John Feast.

All who feel interested in the advancement of Horticulture are invited to lend their aid in furtherance of this design. Those wishing to exhibit plants, or other objects of Horticultural interest, will please communicate their views to the committee of arrangement, stating at the same time the articles they design to exhibit.

Letters on the subject must be addressed to the chairman of the committee, from whom any further information may be obtained.

Baltimore, April 5, 1833.

BUTTER.—A friend waited on us yesterday, to communicate the result of a process, which had been recommended to him, of restoring butter to its original sweetness. Incredulous as he was, he made the experiment, and he authorizes us to say it was entirely satisfactory. It consists simply of churning the butter with sweet fresh milk, in the proportion of about 3 lbs. of the former to half a gallon of the latter. Butter, thoroughly rancid, by this simple process, was rendered sweet and good. Our citizens, in view of the present scarcity and dearness of butter, of even tolerable quality, will not fail to appreciate this discovery.—[Fredericksburg Arena.]

MANGEL WURTZEL FOR CATTLE.—Last year we made an experiment with mangel wurtzel for cattle, and the result was highly satisfactory—so much so, that we shall hereafter adopt it in preference to all other root crops for the purpose. Having about the sixth of an acre of ground prepared for early corn, for which we had not seed enough, we determined to plant it in mangel wurtzel as an experiment, having very little confidence in its equality with ruta baga. We accordingly soaked the seed twenty-four hours in warm water, laid off furrows about two feet apart, and dropped the seed six or eight inches apart, covering it as we do corn. When the plants were up, we passed over the field with a weeding hoe, and subsequently run a small plough through it twice, clearing out the weeds with a hoe. This is all the cultivation it had, and we feel certain that all the work bestowed upon it, including the original preparation of the ground for corn, did not amount to more than two full days' work for one man. We put no manure on the ground, though it had been manured the year before for potatoes, and for planting in early York cabbages, which were killed by the severity of the winter. The soil was a fair medium mould, a mixture of sand, clay, and vegetable matter; high ground, but level. When the mangel wurtzel was gathered, it was estimated by every one at seventy-five bushels; some more, but none less. It was also perfectly evident that we might have taken at least one-fourth more, if not double the quantity, from the same ground, had we planted more carefully and laid the rows fifteen or eighteen inches apart, instead of two feet. There were many places in the rows where there was not a plant for six or eight feet; and then again many places where they were so crowded that the roots could not fairly develope themselves.

As food for cattle, especially for milch cows, our experiment was as follows: In October, our best milch cow began to fail in her milk, and we cut an arm full of the tops of the mangel wurtzel for her; this seemed to have a good effect, and it was repeated night and morning for a week, when she fully recovered her usual supply. The leaves were then withheld, and she immediately failed again in her milk. At that time her full quantity was about twelve quarts a day, and when the mangel wurtzel leaves were withheld, the quantity she gave was only about six quarts. She had a good pasture, with an excellent stream of water in it, and plenty of salt during the time; but at that season the grass does not afford sufficient nutritive matter.

After another week we began giving her the roots of the mangel wurtzel, cut small and occasionally sprinkled with shorts or corn meal, and a little salt: one peck of the roots given thus had the same effect on her milk that the tops had; and we suspended these a week, to try their effect the more certainly. The result was as above stated, a conviction that mangel wurtzel is the best and most profitable root we can raise for milch cows.

After cutting off the leaves they very soon grow out again, so that they may be cut every fortnight. But we think it better to select the largest roots from crowded places, and give them tops and all, as we think the new growth of leaves is at the expense of the roots. —[American Farmer.]

Railroads for the Application of Human Power. By Publicola. [From the American Railroad Journal, &c.]

The force of traction necessary to propel a ton weight on a level railroad is about eight pounds; or, in other words, a man can propel a ton weight on a level railroad as easily as he can walk on that road, and draw up eight pounds over a pulley. To surmount an ascent 66 feet in a mile would require in addition the force necessary to raise 28 pounds over a pulley. But as we know better how much a man may actually draw on a common road, the proposition may be stated thus: that a man may propel one ton on a level railroad as easily as he can draw 112 lb. on a common road. It will not be extravagant then to assume that a man may propel one ton weight on such railroads as it would be practicable to make in our country. To make a railroad with the tracks but 3½ feet apart, sufficiently strong to sustain cars holding but one ton each, and moved by human strength, would not cost a large sum per mile. I venture to calculate that if such railroads should come into extensive use, they would not cost for double tracks more than 2000 dollars a mile on an average.

But would they answer any purpose as channels of trade? Let us see. If there should be a steady stream of cars, each containing one ton, and moving over the railroad at the rate of but two miles an hour, and ten rods apart, 600 tons might pass over in ten hours, and then, excepting the sabbaths, at this rate 187,800 tons might pass over in a year; and on the supposition that a large city has ten such routes entering it from the country, 1,878,000 tons might come to market on such channels of trade during the year. But the tonnage, domestic and foreign, that departed from the whole United States in 1826, was 1,052,429. Supposing that one-tenth of this departed from Boston, one slight railroad, sufficient for a man to move one ton weight upon it at a time in a car, would convey all its merchandize; and two such railroads would convey to New-York all the goods it would export.

If, however, such railroads would be altogether insufficient for large cities, they might be channels of communication between villages in the country, and from small districts of country to great roads.

Where there is business enough to employ sufficiently a very large capital, invested in heavy railroads, and powerful steam carriage, steam will be found a cheaper power than human strength; but there is a vastly greater amount of capital required for such purposes, and yet the conveyance cannot be indefinitely extended: it must be limited by the population and resources of the country.

The cost of a road that shall every where, over vallies and rivers, be strong enough to sustain the weight and movements of a car of ten tons weight, must be about ten times as great as the cost of a road that shall have to sustain at one point but a ton weight.

We should think it absurd to have a huge, heavy pipe, of a foot diameter, to convey water in occasional gushes, when an inch pipe would convey all the water we should desire or could procure, and just as we should need it too. But if some railroads of gigantic dimensions are to traverse the country, let the trial be made, by those who have resources to make the experiment, whether narrow railroads for the application of human strength might not be made that would greatly facilitate communication between different sections of the interior; and that would be to the great railroads, what the little rills and streams are to the Ohio, the Mississippi, and Missouri. Every judicious speculator will wish that his plans may, if possible, be fairly tested by experiment; and tested in this way by those who are able to do it without hazarding losses which they cannot safely bear. The plan here suggested is one that can easily be brought to the test of experiment. If, on a railroad, for half a mile in extent, a man can move a load of a ton weight at the average speed of but two miles, then it will be established that such railroads will be economical, and most convenient lines of conveyance over all the country, and especially to those great railroads where steam machinery works cheaper than men's limbs can do.

Ornamental Trees.—We take the liberty to recommend to every man who has an inch of ground to fill it up with trees. There are many who will do nothing of the kind, because their territories are small. We can assure them that they will find the truth of what Hesiod said to agriculturists thousands of years ago, that half an estate is more than the whole. Within these limits, however small, they produce effects which will fill even with surprise. If their enclosure be within the city where the object is to make the most of their possessions, they should remember that if they cannot have verdure on the soil, they can have it in the air; and if in the country, that nothing gives a more unfavorable and at the same time correct impression of the character of a landholder, than the aspect of an estate which presents no trees along its borders, to shelter the traveller from the sun. Every cottage should have its elm, extending its mighty protecting arms above it. The associations and partialities of children will twine themselves like wild vines around it; and if any one doubt that he will be better and happier for such, he little knows the feeling with which the wayfarer in life returns from the wilderness of men to the shadow,

"Where once his careless childhood strayed,
A stranger yet to pain."

We wish it were in our power to do something to call the general attention to the subject of respect to the dead. It gives a painful feeling to pass through a city or village in our country, and to see the shameful desolation and neglect of the burial place, which, if no longer consecrated by religious acts, should certainly be held sacred by the heart. And yet were it not for the monuments which here and there appear above the golden-rod and the aster, we should not know these from any other barren fields. A vile enclosure of painted wood is all that protects them from violation; and if any tree cast a friendly shadow over it, we may be sure it is one planted by the hand of nature, not of man. We have seen places of this kind in the country, which the fathers of the hamlet seemed to have chosen with a taste seldom found among the early inhabitants of any region, on the banks of the rivers, or the borders of deep forests, where every thing around favored the contemplations to which the mind in such place is and ought to be led, and have found evidence there of the degeneracy, not the improvement, of their children, who had disappointed their designs and suffered all to run to waste and barrenness, whether from the want of refinement or avarice we do not know. It is perfectly surprising that none should be found to take away this reproach. Some of the most uncivilized nations are ages before us in their regard for these delicate and sacred feelings. They would not permit the young and beautiful, the aged and honorable, to be cast into a place so neglected, when even a dog, who had been faithful, would deserve a more honorable grave. Our own evergreen cypress is as suitable as the Oriental to surround the place of death: and were it not so, we have many other trees whose character of form and foliage is well suited to the sad and thoughtful expression which the common feeling requires such places to bear.

There is no need of urging the claims of this kind of improvement upon the inhabitants of our cities. They are in general sufficiently attentive to their public grounds; they confine themselves to a single tree. Can any mortal inform us why a spot like the common of our city—for example, where thousands of these might stand without interfering with the public of each other—should not afford specimens of other trees beside the elm? It is a noble tree, perhaps the finest that could be chosen; but the polished foliage of the oak, the light green of the plane-tree and willow, the various forms and shades of the maple, larches and pine would break the uniformity of the scene, and relieve the eye. Moreover, groups of trees might be scattered here and there to advantage, without injury to the public; for if they should occasionally break the ranks of the train-bands, we apprehend that no serious consequences would endanger the defence of our country. Places for which nature has done much, require the more of man, because they offer him a vantage ground to begin his improvements, and constantly upbraid him if he neglects them. —[North American Review.]

A Bee Story.—A friend told me the other day a bee story, and were he not a man on whose word I can strictly rely, I should set it down as a real Munchausen. Such as it is you shall have it.

In Wythe county, in Virginia, in a spur of the Allegany Mountains, called the "Tobacco Row," is a perpendicular ledge of rock fronting the south-east, about fifty feet high—an open sunny situation. About thirty feet from the base, a horizontal crack or fissure opens in the rock, from half an inch to six inches in width, and extending near eighty feet in length. How deep this fissure extends into the mountains is not known, as no one has ever examined it. *This fissure is full of bees!* Their numbers are so great, that in the summer time they hang out in huge clusters for several feet, above and below the fissure, in its whole length. A short distance above are two other cracks, containing earth, in which grow some little chinquapin bushes, and these are covered with the bees. They frequently go off in huge swarms, like a barrel or hogshead in bulk, and are often compelled to return, finding no place large enough to contain them. In the spring, previous to commencing their labors, the dead bees, remnants of comb, and cleanings of the habitation which are brought out and dropped by them, make *a win'-row* of a foot in height the whole length of the opening.

My informant saw it in the month of June, when immense numbers of bees were out on the surface, making great patches of rock black with their swarming masses. The oldest inhabitants say that the first settlers found the bees there, and the Indians told them that their oldest traditions knew nothing of its origin. "*It was always there.*"

No one has ever been found bold enough to attempt its plunder, or to examine the place where they are. It is, in fact, too dangerous an enterprise to meddle with.

If these facts be so, and I cannot doubt it, does it not form rather a new feature from that generally received in the history of the bee? *I rather guess there is more than one queen in that hive!* By the way, I fear that I am going to have all this bee discussion to myself. But we'll see.

Do none of the correspondents of the American Farmer live near this great bee hive? If so, I should be much gratified to hear further about it.—[Genesee Farmer.]

Animal Power.—Dupin states, that in Great Britain the animal power is eleven times as the manual power, while in France it is only four times as great. Also, that Britain consumes three times as much meat, milk and cheese, as France. In Hanover there are 193 horses to every 1000 inhabitants, 145 in Sweden, 100 in Great Britain, 95 in Prussia, 79 in France.—[Bull. des Sc. Agri.]

Bright Colors.—All animals of this genus are particularly offended with glaring colors, so that it is dangerous to expose one's self with red garments among herds that are not extremely docile; and even the common milch cow, so docile and tractable, will sometimes take offence at a red shawl, and render the safety of the wearer precarious.